This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

BLACKWOOD'S CLASS-BOOKS.

GEOGRAPHY.

PHYSICAL GEOGRAPHY.

GEOLOGY.

BLACKWOOD'S CLASS-BOOKS—continued.

HISTORY.

CLASSICS.

ENGLISH.

ARITHMETIC.

GEOGRAPHY.

A New and greatly Improved Edition,

MANUAL

OF

MODERN GEOGRAPHY,

MATHEMATICAL, PHYSICAL, AND POLITICAL,

ON A NEW PLAN;

EMBRACING A COMPLETE DEVELOPMENT OF THE RIVER-SYSTEMS OF THE GLOBE.

BY THE

REV. ALEXANDER MACKAY,

LL.D. F.R.G.S.

In Two Parts. Part I., pp. 344, is now published, price 4s.

OPINIONS.

Annual Address of the President of the Royal Geographical Society (Sir Roderick I. Murchison). — We must admire the ability and persevering research with which he has succeeded in imparting to his Manual so much freshness and originality. In no respect is this character more apparent than in the plan of arrangement, by which the author commences his description of the physical geography of each tract by a sketch of its true basis or geological structure. The work is largely sold in Scotland, but has not been sufficiently spoken of in England. It is, indeed, a most useful school-book in opening out geographical knowledge.

Saturday Review.—It contains a prodigious array of geographical facts, and will be found useful for reference.

Guardian.—Its peculiar characteristic is its elaborate arrangement of the river-basins, so as to present in one view all the towns on each river, with their relative size. In other respects, it is a full and methodical school-book, suitable to the highest classes of geographical students.

Illustrated London News.—So complete and so philosophical a Manual of Geography we believe has not hitherto existed.

The Athenæum.—It is an excellent cyclopædia of geographical knowledge, and may be advantageously employed as a book of reference. . . . Great stress is laid on physical geography, and the river-systems of the globe are developed in a manner never before attempted.

English Journal of Education.—Of all the Manuals on Geography that have come under our notice, we place the one whose title is given above in the first rank. For fulness of information, for knowledge of method in arrangement, for the manner in which the details are handled, we know of no work that can, in these respects, compete with Mr Mackay's Manual.

Spectator.—In the two essential points of completeness and compactness, this is by far the best geographical Manual with which we are acquainted.

Daily News.—Combines fulness with compactness in an extraordinary degree. It is eminently practical in its arrangement, while ample care is taken throughout to place the facts in their scientific relation. . . . The volume will be found very useful either in the school or the counting-house.

Critic.—This is perhaps the most elaborate and carefully-written text-book of geography which has ever come under our notice. D'Anville himself would, we think, were he living, give it his meed of warm approbation.

Educational Guardian.—Pupil-teachers, students in training colleges, &c., will find it both interesting and valuable. They have here all they can, as students, ever require; and, as a text-book, it may be recommended as being as far in advance of Cornwell's and Sullivan's treatises as these were superior to the catechisms and grammars which they have superseded.

London Review.—This is an excellent work, in every page showing traces of the great care and labour bestowed upon its compilation. . . . We may safely pronounce it to be the most useful and cheapest handbook of geography now in circulation.

Weekly Despatch.—This 'Manual of Modern Geography,' founded on a mathematical, physical, and political basis—a triumvirate which combines every requisite which is necessitated by the purposes of the book—is an admirable specimen of compilation. As a work of reference, therefore, its claims are enhanced by the evident reliability of its ample contents.

Educator.—This Manual contains a vast amount of information, collected with great care, while the matter has been so arranged as to aid both the teacher and scholar. The most recent information has been sought, and no pains have been spared to secure accuracy in the minutest details.

Freeman.—By far the best and completest Manual of Geography that we have seen.

Scotsman.—It is a miracle of condensation. . . . This wide variety of matter called for good arrangement, and the book is, in truth, extremely systematic and methodical in its construction, and bears abundant marks of painstaking in its execution.

Aberdeen Journal.—It will take the first place among works of the kind, and do more than any other to facilitate and make interesting the study of geographical science.

Inverness Courier.—A more comprehensive and useful work for systematic instruction in schools and for occasional reference has probably never been published.

Nonconformist.—After making ourselves minutely acquainted with the method and general execution of this book, we are of opinion that it is, on the whole, the best recent work on geography.

WILLIAM BLACKWOOD AND SONS.

MANUAL

OF

MODERN GEOGRAPHY

MATHEMATICAL, PHYSICAL, AND POLITICAL

ON A NEW PLAN

EMBRACING A COMPLETE DEVELOPMENT OF THE RIVER SYSTEMS OF THE GLOBE

BY THE

REV. ALEX. MACKAY, LL.D. F.R.G.S.

AUTHOR OF

'FACTS AND DATES;' 'ELEMENTS OF MODERN GEOGRAPHY;' 'OUTLINES OF MODERN GEOGRAPHY;' 'FIRST STEPS IN GEOGRAPHY,' ETC.

NEW AND GREATLY IMPROVED EDITION

PART I.

WILLIAM BLACKWOOD AND SONS

EDINBURGH AND LONDON

MDCCCLXX

201. a. 140.

PREFACE TO SECOND EDITION.

THIS edition of the Manual of Modern Geography has been thoroughly revised throughout, and in numerous sections entirely rewritten. The Manual was the Author's literary firstborn, and on it were fondly lavished all the privileges and affections inseparable from primogeniture. Many long years were cheerfully devoted to its first production, when the Author had to labour single-handed, in a remote corner of the land, with few books and still fewer friends to consult. He had his reward, however, in the emphatic verdict of the public press, and the unqualified approbation of eminent educationists from all parts of the British Empire.

As the First Edition, however, consisted of a very large impression, wellnigh a decade of years has elapsed since its preparation, and in that decade numerous changes have taken place in all departments of Geography, as also in all the sciences with which it stands most closely connected. In order, therefore, to place the work a second time wholly abreast of the progress of events, no less than an entire year of uninterrupted labour has been devoted to this Edition.

A large portion of the Political Geography had to be

recast, especially the sections relating to the British Isles, North Germany, France, Italy, Russia, India, the United States, and the British Colonies; while those bearing on Astronomy, Geology, Meteorology, Commerce, Manufactures, and Inland Communication, had to be rewritten.

Whatever other results may follow from the "activity" of Napoleon, Count Bismark, and Garibaldi, or from the earnest investigations of their compeers in the various fields of physical science, there can be no doubt as to the immense labour they have imposed on the student of Geography.

At the earnest advice of some educationists in England, who did not require the whole work in any one session, the publishers have resolved to issue it in Two Parts, which may be had separately from the booksellers; while those who prefer it may have the two bound together in one volume, as in the First Edition, and at the same price. A copious Index will be found in Part II., embracing all the geographical names in the Manual.

In this Edition, a brief Historical Sketch has been added to the Political Geography of all European countries, as also several new Diagrams illustrative of the Seasons, the Tides, and the Succession of Life in the pre-Adamite ages of our Planet's history. It is hoped that the work will be found increasingly useful to Teachers, Advanced Classes, Candidates for the Civil Service (Home and Foreign), and especially as a work of reference.

OAKLAND, THE GRANGE,
EDINBURGH, 15*th May* 1870.

PREFACE TO FIRST EDITION.

CONSIDERING the improved methods now generally adopted in teaching Geography, the ever-expanding dimensions of our own gigantic empire, the numerous additions recently made to our knowledge of foreign countries, and, as a consequence of these, the increasing interest felt by educated persons in every department of the science, the Author deems it superfluous to offer any apology for issuing the present Manual. As it differs, however, somewhat widely, both in matter and arrangement, from all its predecessors, it may be necessary here to describe its more prominent characteristics.

The work commences with a brief account of the relation of the Earth to the Solar system, and of the latter to the other worlds which people space.

The form and materials of the globe, the configuration of its surface, its climate, mineralogy, geology, botany, zoology, and ethnography, are next discussed; and thus a foundation is laid for the subsequent details in Physical and Political Geography.

The individual continents and minor divisions of the earth's surface then pass successively under review. Each of these is viewed from many sides, and the results presented to the learner in a corresponding series of brief but pointed sections.

The precise *order* in which the different sections should stand was a subject of much careful reflection. While in most other works on geography the physical and political stand widely apart, they are here intentionally combined, and so made, not only to reflect mutual light on each other, but also to correspond more closely with the manner in which the realities to which they refer interpenetrate one another in nature.

Without adverting to the contents of each of the sections individually, the Author can here only notice those of them in which he has departed most widely from the usual routine. The first departure occurs under the heading POSITION AND BOUNDARIES. It is singular what confused notions prevail, even among otherwise accurate geographers, regarding the relative position of the best-known places. For example, how few ordinary students of geography could say, without consulting globe or map, what other important places have the same latitude and longitude as London, Edinburgh, or Madrid! To remedy this, a single sentence is uniformly added to this paragraph, mentioning all the most important places on the globe lying on the same parallel and meridian with the capital of the country under review, or with the central point of the latter, should the capital happen to be situated at some distance from its centre. In addition to the greater familiarity with the relative position of places which is

thus communicated, these brief notices, it is hoped, will be found serviceable to the student when comparing the climates, botany, and zoology of different countries.

Under the AREA of each country, in addition to the information usually given, its magnitude is invariably compared with that of the British Isles collectively, or with one or other of the kingdoms composing them; and a similar comparison is drawn regarding its POPULATION, which in every instance embodies the results of the most recent census or estimate.

The articles entitled "POLITICAL DIVISIONS" have been thoroughly elaborated, in accordance with the best maps, and a new principle of arrangement adopted. Instead of adhering to the prevailing custom of giving under each province or county a dry list of cities and towns wholly unconnected by any system of arrangement, the writer had no hesitation in availing himself of a principle equally simple and beautiful with which nature supplied him. He refers to that great axiom in geography, that *all the cities and towns on the earth's surface, whether ancient or modern, stand on the banks of rivers, or on the sea-coast.* This principle is universally valid, notwithstanding a few apparent instances to the contrary.

Till very recently, when the canal and the railroad have to some extent supplied their place, rivers have in all ages formed the great highways of commerce. In every land the banks of rivers present the most fertile portions of the country, as the valleys of the Tigris, the Euphrates, the Nile, and the Jordan; and have formed the earliest seats of civilisation—as, for example, Nineveh, Babylon, Heliopolis, Damascus — the origin of which dates back to the dawn of history. So close, in short, is the connection between the rivers of a country and its towns, that there is no exaggeration in saying that the rivers have *created* the towns; or that, without the rivers, the towns would have had no existence. In no system of geography founded on natural principles can this connection be overlooked. The political boundaries of a country will vary from time to time with the varying fortunes of its rulers, but its rivers will continue to flow in their wonted channels, and the cities that grace their banks will continue to pay them their wonted homage. Rivers are majestic trees that have their roots fixed in the ocean, and their tops reaching the clouds; the great cities of the world hang around their stems; while the towns and villages cluster like fruit on their branches.

Hence, though the Manual embraces some other original features, it was the intimate connection subsisting between rivers and towns that led to its production, and that forms the principal basis on which it rests. While the influence of this

connection can be traced in almost every page, three of the twenty-four sections usually devoted to each country are entirely occupied with its elucidation—viz., those entitled "Principal River-Basins," "Political Divisions," and "Table of Rivers and Towns." The first of these shows the dimensions of all the larger river-basins, and indicates at a glance how many provinces or counties they embrace either wholly or in part. In the second it necessarily occupies a somewhat subordinate place; for not only must the towns with their population be placed in the foreground—the name of the river being placed after them within parentheses—but the boundaries of the provinces continually interrupt the continuity of the rivers. The capital of a province is, moreover, placed first, even though it should not stand nearest to the river's mouth; and, finally, only the larger towns in each province have the rivers on which they stand indicated lest the learner should be overburdened with their multiplicity. All the towns, however, whose population ranges between 5000. and 10,000 are immediately subjoined, but in a smaller type, to indicate that they may be omitted in a first perusal. The only departure from this is in the case of the United Kingdom, in treating of which it was considered necessary to embrace towns of a much smaller population.

But the third of these paragraphs, or those denominated "Tables of Rivers and Towns," are those to which the Author would direct most special attention, as presenting at once the most original portion of his Manual, and the fullest exhibition of his peculiar method. An immense amount of time and labour has been expended on these tables; but, judging from experience, the Author is convinced that their importance to the student, and the labour and time they will save to the teacher, fully justified the sacrifice; for he is aware that many of the most successful teachers of geography are in the daily habit of drilling their classes more or less in accordance with the method here so fully developed, but having no reliable guide to direct them, each of them is obliged to draw out a scheme for himself, from such materials as he may have at command.

Having said so much on the "River System," properly so called, space will not allow an equally minute description of the other paragraphs. Suffice it to say, that similar care and patience have been bestowed on all of them. THE MOUNTAIN-RANGES and the LAKES are more systematically arranged, and their connection with the river-basins more closely exhibited, than in any other existing Geography.

The sections describing the CLIMATE, GEOLOGY, MINERALS, BOTANY, and ZOOLOGY of the different countries, have been drawn up with the greatest care, and from the most recent and

accurate authorities; while those that discuss their ETHNOGRAPHY are the result of much earnest research. Under the last-named head have been sketched, not only the race, religion, national character, form of government, and education of the different nations, but their language and literature have also received the attention to which they are entitled. The former of these is briefly described, and its *relation to other languages* carefully stated; while the latter embraces elaborate lists of all the more *Eminent Names* that adorn the literature of their country. The ethnographical sections are followed by brief descriptions of the Army and Navy, Public Debt, Revenue and Expenditure, Commerce, Manufactures, Exports and Imports, Inland Communication, and Foreign Possessions (if any) of the various states, in the preparation of which the most recent statistics have been consulted.

The DESCRIPTIVE NOTES, which are appended to the Political Divisions, are considerably more numerous than is customary in geographical manuals, especially the notes on the counties and towns of the British Isles, and all other parts of the British Empire.

The PRONUNCIATION of geographical names is invariably a matter of deep interest, alike to teachers and pupils. Instead of following the prevalent custom of giving the pronunciation of difficult words, all arranged in one general catalogue, the Author considered it much more conducive to the student's improvement to insert, under each individual country, short but explicit Rules founded on the peculiar genius of its own language, and followed by appropriate examples, as pronounced by the natives.

The Author cannot conclude these observations without expressing his deep obligations to those valued friends who so generously assisted him in his self-imposed task. His best thanks are due to the Rev. M. Mackay, Fordyce, for his aid in connection with the topographical sections, the minuteness and accuracy of which are in a great measure the result of his unwearied labours: and to A. Keith Johnston, Esq., LL.D., Her Majesty's Geographer for Scotland, for the many valuable items of recent information with which he favoured the Author during the composition of his Manual, and for his great kindness in volunteering the final revision of the proof-sheets. Great aid has also been received throughout from the various published works of this eminent geographer, especially from his admirable 'Dictionary of Geography,' and the new edition of his 'Physical Atlas of Natural Phenomena,' which will long remain the great thesaurus from which other writers will draw their most valuable materials, and the publication of which has formed an era in the annals of physical geography.

CONTENTS OF PART I.

	PAGE
DEFINITIONS,	1
MATHEMATICAL GEOGRAPHY,	2
PHYSICAL GEOGRAPHY,	16
MATERIALS, DENSITY, AND ATTRACTIVE POWER OF THE EARTH,	16
CONFIGURATION OF THE SURFACE,	17
THE OCEAN,	21
THE ATMOSPHERE,	26
CLIMATE,	32
MINERALOGY,	36
GEOLOGY,	38
BOTANY,	52
ZOOLOGY,	55
ETHNOGRAPHY,	58
POLITICAL GEOGRAPHY,	63
EUROPE,	68
THE BRITISH EMPIRE,	93
GENERAL VIEW OF THE BRITISH ISLES,	95
ENGLAND AND WALES,	113
SCOTLAND,	144
IRELAND,	162

Spain and Portugal, ... 174
France, ... 193
Belgium, ... 214
Holland, or the Netherlands, ... 220
Denmark, ... 229
Germany, ... 234
Prussia and the North German Confederation, 236
South Germany, ... 249
Austria, or Austro-Hungarian Empire, . . 255
Switzerland, ... 271
Italy, ... 280
Greece, ... 298
Turkish or Ottoman Empire, ... 305
Turkey in Europe, ... 306
Russian Empire, ... 317
Russia in Europe, ... 318
Sweden and Norway, ... 336

ILLUSTRATIONS.

The Circle and Sphere, ... 10
Parallels and Meridians, ... 12
Zones and Circles, ... 14
The Tides, ... 15
Attractive Energy of the Earth, ... 17
Geological Succession of Life, ... 51

Erratum.

Page 19, line 9, *for* 50° N., *put* 30° N.

MANUAL OF GEOGRAPHY.

GEOGRAPHY is that science which has for its object the description of the surface of the Earth, or of that member of the Solar System which forms the abode of Man.

Though in regard to practical importance it occupies the foremost place among the physical sciences, it has been the last to receive the attention which is due to it. It consists of two principal branches—viz., Ancient Geography, which embraces the lengthened period intervening between the earliest dawn of history and the fall of the Roman Empire; and Modern Geography, which extends from that event to the present time. The latter is subdivided into four departments—viz., Mathematical, Physical, Political, and Historical.

Mathematical Geography treats of the Earth in its relations to other celestial bodies; of its motions, form, and magnitude; and of the true position of places on its surface.

Physical Geography treats of the configuration of the Earth's crust; the materials of which it is composed; the soil and climate that prevail at different parts of the surface; and the effect of the latter on its living inhabitants—plants, animals, and man.

Political Geography—the only branch of the science which received adequate attention in the schools of this country till of late years—treats of the artificial or political divisions of the surface into empires and states; their extent, population, and material resources; their government, people, religion, language, and civilisation.

Historical Geography endeavours to establish when and by whom the different countries were first peopled; the political changes which they have subsequently undergone; and especially the progress of geographical discovery in modern times.

The first and second of these branches require separate consideration; the third and fourth will be treated of in connection with the individual countries.

PART I.

MATHEMATICAL GEOGRAPHY.

1. Position of the Earth and its Relation to other Worlds.—The earth on which we live is not to be regarded as an isolated, independent body, having no relations to other worlds; but as one of the members of a large family of similar bodies collectively called the Solar System, all the parts of which are united in one beautiful and harmonious whole by the mysterious power of gravitation.

The Solar System.—This system is so named from the fact that the sun (Lat. *sol*) is by far the largest body belonging to it—that he is placed in the centre, all the other members of the system revolving around him, either directly or indirectly—and especially to distinguish it from the numberless other systems that are located around it in universal space, each of which has probably its own sun or star as the immediate centre of its light, heat, and gravitating power. So far as presently known, the solar system consists of 134 distinct bodies—viz., the sun; 9 large planets revolving around him in nearly circular orbits; 106 planetoids, or smaller planets, between the orbits of Mars and Jupiter, supposed by some to be the fragments of a large disrupted planet; 18 satellites or moons, one of which belongs to the earth, and all the others to the four most distant planets; besides a host of comets, which move in extremely elliptical orbits, and myriads of meteorites. Only a very few of this large number were known to the ancients—viz., the Sun, Earth, Moon, Mercury, Venus, Mars, Jupiter, Saturn, and a few of the more remarkable comets. All the remainder have been discovered since the invention of the telescope by Galileo in the beginning of the seventeenth century. The centre of this wonderful piece of mechanism is occupied by the sun, a huge mass of opaque matter, 1,245,000 times the size of the earth, but surrounded by a luminous atmosphere. Though stationary in relation to the other members of the system, he is in reality advancing through space—carrying in his train his numerous retinue of planets, satellites, comets—with a velocity of 17,580 miles per hour. This velocity, however inconceivable, is exceeded nearly fourfold by that of the earth in her annual circuit round the sun. The planets move around the sun in elliptical, but nearly circular, orbits, and in the same general direction, though at various distances, velocities, and periods of revolution, as shown in the following tables (p. 6, 7). The satellites perform similar ellipti-

cal orbits round their primaries; while the paths of the comets are highly eccentric, consisting for the most part of extremely elongated ellipses.

Cause of Elliptical Motion.—This elliptical motion is the result of the composition of two forces acting on the planet simultaneously, but in different directions. The first of these is called the *centrifugal* or *tangential force*, and is that which the planet received from the hand of the Creator when originally launched into space. This force, if unrestrained by any opposing one, would carry the planet wholly away from the sun, and project it into the depths of infinite space. But it is opposed or counteracted by the *centripetal force*, a force always acting at right angles to it, and directed towards the sun, or rather towards the centre of gravity of the entire system—a point situated within that body, though at a great distance from its centre. The latter force, again, if acting alone, would cause the planet to move towards the sun in a straight line, and with continually accelerated speed. But as both forces are incessantly operating, the planet must, in giving obedience to each of them, describe a curvilinear path. The curve so described will, in every case, be one of the *conic sections*—that is to say, it will be one or other of the various curves obtained by cutting a cone in all the possible directions. It will depend, however, on the particular circumstances of the case—viz., direction, distance, and velocity—which of the curves shall be described—*i.e.*, whether a circle, an ellipse, a parabola, or an hyperbola. Thus, the orbit will be a *circle*, when the square of the tangential velocity is equal to the diameter of the circle multiplied by the centripetal velocity; it will be an *ellipse* when the former product is greater than the latter; a *parabola*, when the former product is exactly twice as great as the latter; an *hyperbola*, when more than twice as great; and, in every case, the angular velocity of the *radius-vector* must be inversely proportional to the square of the mutual distance of the two bodies.

The "Cause of Elliptical Motion," as above described, cannot be easily comprehended without some inquiry into the cause of *all* motion, or, in other words, without an inquiry into the relation subsisting between the Creator and the material universe. That relation, though no doubt profoundly mysterious, is not one regarding which we are left wholly in the dark; for what human philosophy, left to its own unaided resources, might never succeed in *discovering*, the Creator has been pleased to *reveal*. Since the announcement of the law of universal gravitation, physical science has made unparalleled progress in all directions, yet to this day the most incoherent theories regarding the cause of motion, and the ultimate source of the mighty energies everywhere observable in the material world, have been propounded. Many philosophers appear to regard the attractive power of gravitation as a mere property of matter. It is either, they maintain, a property essential to the *very existence* of matter, or which, though not originally belonging to matter, has been communicated to it by the Creator, and which is now so indelibly stamped thereon that it may be said to be inherent in it, so as to form part and parcel of its being. And not only, it is argued, does this hold good of gravitation itself (as existing between the orbs of space), but also of all

its varieties and modifications, as magnetic attraction, chemical affinity, electric attraction, cohesion, and adhesion—all are mere properties of matter, a conclusion beyond which it would be in vain to push our researches. Now, if this result is to be accepted, all the so-called laws of nature are merely the necessary and inevitable consequences of these unchanging and unchangeable properties of matter. According to this view it follows, that the physical universe, though abandoned by its Maker—whose sustaining hand, indeed, is no longer required—will not only continue in existence, but will for ever carry on, without interruption or diminution, its present multiform activities. In our opinion, no view could possibly be more perverse, however eminent in science some of its propounders. It wholly fails in satisfying the cravings of every earnest inquirer who searches for truth as for hidden treasure. We cannot suppose it possible that the Creator should abandon the universe to the play of its own activities. He cannot take up the position of a mere spectator, and contemplate from a distance the mighty machine He has set in motion. To do this would be to insure its instant destruction. For He not only created the worlds by His fiat, but "in Him all things consist," and He "upholdeth all things by the word of His power." According to these divine utterances, the forces that are at work in nature are not inherent in matter, but in that Almighty Being who not only summoned matter into existence, but who continues to sustain it in being and in the possession of all its properties. In short, we arrive at the grand and fundamental principle, *that material objects can never become the ultimate fountains of any species of power, and that mind is the true source of all power and of all motion.*

It will greatly aid us in forming a right conception of the relation subsisting between the Divine Mind and the universe, if we carefully consider the relation that subsists between the human mind and body. This relation is easily discovered, and is profoundly instructive. It differs greatly from the relation in which the mind stands to objects *external* to the body. Over these the mind has no immediate control: they cannot hear any voice nor obey any command. Even the members of our own bodies give no obedience to commands audibly expressed, unless such commands are accompanied by acts of *volition;* but no sooner does the mind *will* that the hand or the foot shall perform any motion, than it is responded to by an act of instant obedience. So brief, indeed, is the interval between the mental volition and the resulting motion, that human science cannot measure it. The will, however, has no such control over objects foreign to the body—acts of volition have no effect upon these. The direct power of the mind is limited, in every case, to the organised body which it animates. Now, there must be a close analogy between this relation of the mind and body of man and the relation subsisting between the Divine Mind and the physical universe, for "God created man in His own image, after His likeness." This inspired utterance, like a pure and perfect crystal, has many sides; and the side nearest our present point of view undoubtedly teaches, that the Almighty exercises over the material universe a control closely analogous to that which the human mind exercises over its own corporeal organism. Analogy, however, is not identity, and the material universe is not an organised body which the Divine Mind animates. He is not "the soul of the universe," and still less is He that impersonal abstraction about which the Pantheist dreams, but a gracious and loving Father, who ever feels the deepest interest in the wellbeing of His children. Analogy is not identity, but even analogy is of importance where the aids are so few, and where the lights burn so dimly. And that there *is* an analogy

is beyond all doubt; for, on the one hand, the mind of man exercises a supreme control over the members of his own body; while on the other, the Divine Being has ever continued from the morning of creation to maintain, by the silent forthputtings of His will, the most absolute control over all His creatures. Sun and moon and stars, the winds and waves and raging storms—all are His servants, and all are obedient to His will. The laws of nature—generally regarded as so mysterious, and to which some would assign a position due to the Lawgiver alone—find here their true explanation: they are simply a convenient name for the incessant volitions of an unchangeable God. He can suspend these laws at pleasure, and He has, in fact, suspended them once and again. But from the point of view from which we are contemplating the Creator and His works, there is no more of mystery in the so-called miracle than in the regular course of nature.

Progress of Discovery.—The true system of the universe was not understood till near the middle of the sixteenth century, when the illustrious Copernicus (born at Thorn, in Prussia, 1473) began the solution of the vast problem, by showing that the sun is the centre of our system; that the planets move around him in *circular* orbits; and that the daily motion of the heavenly bodies is only apparent, and caused by the rotation of the earth on its axis. Several phenomena, however, remained inexplicable under this theory, such as the change of planetary velocity in different parts of their orbits, and the consequent alteration of their apparent magnitudes,—appearances inconsistent with the assumption of their moving in perfectly circular orbits. A century after Copernicus, the immortal Kepler appeared (born at Weil, in Würtemberg, in 1571), and devoted his life to the explication of these difficulties. The result was the three famous "laws" which will ever retain his name, and which may be ranked among the most brilliant discoveries ever made in science. They are as follow:—

1. The orbits of the planets are *ellipses*, which have all a common focus, and in this focus the sun is situated.
2. If a line be drawn connecting any planet with the centre of the sun, that line—called the *radius-vector*—will describe equal areas in equal times, in whatever part of the orbit the planet may be moving.
3. The squares of the times of revolution of any two planets are to each other in the same proportion as the cubes of their mean distances from the sun.

Finally, the world-renowned Newton (born at Woolsthorpe in Lincolnshire, in 1643) placed the keystone in the mighty arch erected by his predecessors, by discovering the law of universal gravitation, and thus completing the theoretic view of the planetary system. The satellites of Jupiter were discovered by Galileo in the beginning of the seventeenth century; those of Saturn, by Huyghens and Cassini, in the latter half of that century; Urănus, by Herschel, in 1781; Neptune, by Adams and Leverrier simultaneously, in 1846; Vulcan, by Lescarbault, a French physician, in 1859; and all the planetoids during the present century. Every year, indeed, is adding new members to the system, as instruments are improved and the number of observers multiplied.

Astronomical Tables.—The following tables,—originally constructed by Professor C. Piazzi Smyth, Astronomer-Royal for Scotland, and subsequently revised by him and brought down to the present state of astronomical science,—give in detail all the most important of the numerous interesting facts hitherto ascertained regarding the different members of the solar system. On comparing these tables with those published in the first edition of this work, it will be seen that astronomers have not been idle during the last ten years—that numerous corrections and rectifications have been made in almost every column; and that, in particular, the great physical problem of the age—the true mean distance of the sun from the earth—has made rapid progress towards a satisfactory solution. This problem is fully discussed in the author's recently-published work, 'Facts and Dates' (Edinburgh, Blackwood & Sons), and need not be repeated here. That distance, it may now be confidently assumed, is 92,093,000 miles; for that is at once the grand mean of all recent researches, as also the number clearly indicated by that marvel of architecture, the Great Pyramid of Jeezeh, now shown to have been erected B.C. 2170. In accordance with the third law of Kepler, the earth's distance from the sun determines the distances of all the other planets, the proper numbers for which have been drawn up by the indefatigable W. Petrie, civil engineer, whose labours have had no small share in solving the great problem referred to:—

THE SOLAR SYSTEM.

Names and Order of the Planets.	Mean Distance from the Sun in Miles.*	Periodic Time of Revolution in mean Solar Days.	Velocity in orbit per hour in Miles.	Time of Rotation on Axis in Solar Days.	Amount of Light—Earth = 1.	Number of Moons.
				Days, ho. m.		
Sun			17,583	25 7 48		
Vulcan	13,082,000	19.70	174,000			
Mercury	35,649,000	87.97	105,330	1 0 5	6.656	0
Venus	66,614,000	224.70	77,050	28 21	1.932	0
Earth	92,093,000	365.25	65,533	1 0 0	1.000	1
Mars	140,322,000	686.98	53,090	1 0 37	.436	0
Minor planets	259,000,000	1,684.74	39,882		.130	0
Jupiter	479,141,098	4,332.62	28,744	9 55	.036	4
Saturn	878,461,000	10,759.30	21,221	10 29	.011	8
Uranus	1,766,565,000	30,686.82	14,963	9 30	.003	4
Neptune	2,766,133,000	60,126.71	11,958		.001	1

* Profesor Bode, of Berlin, in 1778 pointed out the following remarkable empirical law, relative to the distances of the planets from the sun and from each other: "The distance between the orbits of any two planets is nearly twice as great as that between the orbits of the next two nearer the sun." Thus suppose the distance of Mercury from the Sun to be represented by 4; then, Venus will be 4+3, or 7 such distances; the Earth 4+twice 3, or 10 such distances, &c.

	Polar Diameter in Miles.	Equatorial Diameter in Miles.	Volume or size—Earth = 1.	Mass or Weight—Earth = 1.	Density or Specific Gravity—Earth = 1.	Force of Gravity at Surface—Earth = 1.	Inclination of Planet's Equator to Plane of Orbit.
							° ′ ″
Sun	852,381	852,584	1,245,130.000	314,760.00	.25	27.20	
Vulcan	785?	785?					
Mercury	2,962	2,962	.052	.07	1.24	1.15	
Venus	7,510	7,510	.851	.79	.92	.91	49 58 0
Earth	7,899	7,925	1.000	1.00	1.00	1.00	23 27 24
Mars	4,036	4,920	.139	.12	.96	.50	28 51 0
Minor planets	670*	670					
Jupiter	53,151	88,400	1,387.431	300.86	.22	2.45	3 4 0
Saturn	64,714	71,904	746.898	90.03	.12	1.09	26 49 0
Uranus	29,722	33,024	72.359	12.64	.18	1.05	90 0 0
Neptune	36,620	36,620?	98.664	16.76	.17	1.20	
Moon	2,158		.024	.013	.63	.17	

2. Relation of the Solar System to the Universe.—The Solar System, or the sun with his accompanying train of planets, satellites, and comets, constitutes but a small portion of the material universe. When we survey the heavens at night, we behold a multitude of luminous objects called stars; and, by the assistance of a good telescope, myriads more become visible. Their apparent magnitudes are very different, and this difference has been made the basis of classification in forming some estimate of their number. Those visible to the naked eye are divided into six classes: the brightest stars are said to be of the first magnitude; those of an inferior degree of brightness, of the second magnitude; and so on, down to the sixth, which comprises the smallest stars visible to the naked eye in the clearest moonless night. The telescope vastly extends the power of vision, and astronomers are familiar with stars of the sixteenth degree of magnitude; and there is no reason to suppose that this is the limit to the progression, as every increase in the dimensions and power of the instrument brings into view myriads of stars that were invisible before.

Number of the Stars.—The total number of stars visible to the naked eye in the most favoured localities is about 5000. It is only at the equator, however, that so large a number can be seen; for there only the spectator has the opportunity of seeing the whole heavens, without altering his position. Should he take up his position at either of the poles, no more than half the starry firmament can ever pass in review before him; while at all intermediate positions, the number of stars visible in any one night will depend on the latitude of the place. Argelander of Bonn has classified the

* Pallas the largest of them.

number of stars visible to the naked eye as follows: Stars of the first magnitude, 20; second magnitude, 65; third magnitude, 190; fourth magnitude, 425; fifth magnitude, 1100; sixth magnitude, 3200. Total number visible at equator, 5000. It thus appears that each inferior class is about three times as numerous as the one preceding it. The whole number of stars already registered, down to the *seventh* magnitude, is about 18,000; and some astronomers have estimated the total number of stars visible by means of the best telescopes, down to the sixteenth degree of magnitude, at 500,000,000,000! Prodigious as this number is, it will be indefinitely increased as the powers of the telescope are extended; and, for aught we know, the actual number of the stars may be absolutely countless.

Distance of the Stars.—The distance of the fixed stars from our sun is as inconceivable as their number; but, until recently, there were no data from which any probable calculation could be made. In the year 1838, however, the parallax (or angle subtended by the diameter of the earth's orbit, as seen from a star) was measured in the case of three of them. The parallax of *α Centauri* was ascertained by Professor Henderson of Edinburgh to be 0".9128, or nearly *one second;* that of 61 *Cygni*, by Professor Bessel of Königsberg, who found it to be 0".3483; and that of *α Lyræ*, by Otto Struve, who found it to be about 0".25, or a quarter of a second. The major diameter of the earth's orbit being about 185,000,000 of miles, a parallax of *one second* will give a distance of 20,000,000,000,000 (twenty billions) of miles, which is probably the distance from our sun of the nearest fixed star;—a distance so great that light, which travels at the rate of 185,000 miles per second, would require 3½ years to traverse it. The distance of the star 61 *Cygni*, its parallax being only ½ of a second, will be *three times* this number; and of *α Lyræ*, whose parallax is ¼ of a second, will be *four times* twenty billions! The distance of twelve fixed stars is now approximately determined.

Magnitude of the Stars.—In the present state of astronomical science, the magnitude of even the nearest of the fixed stars cannot be given with any degree of accuracy. It is certain, however, that, in general, they are greatly larger than our sun; for were the sun to be removed from his present position, where he has an apparent diameter of 32′ 3″, and made to occupy the place of *α Centauri*, which is regarded as the nearest of the fixed stars, his diameter would be reduced to 0".0093, or less than the hundredth part of a second. Here he would fail to be seen by the naked eye, and no telescope ever invented could give us any idea of his size. If, on the other hand, *α Centauri* were removed from his actual position, and made to occupy the place of our sun, it is calculated that the light which he emits would be 2½ times greater than that of the sun; and hence, it is argued, his *magnitude* must be correspondingly greater. The intrinsic splendour of Sirius is 63 times greater than that of *α Centauri*, and 147 times greater than that of the sun; and hence it is supposed the magnitude of Sirius is 147 times greater than that of our luminary. Considerable uncertainty, however,

attaches to this mode of estimating the magnitude of those distant bodies. The light of the sun is so immensely superior in intensity to that of any star that it is impracticable to obtain any direct comparison between them, and it is only by using the moon as an intermediate term of comparison that any approximation to accuracy can be made. Wollaston, in 1829, found the proportion of the sun's light to that of the full moon to be as 801,072 to 1; while the light of the full moon exceeds that of *α Centauri* in the proportion of 27,408 to 1. Combining these results, he calculated the light of the sun as exceeding that of the star 21,955,000,000 times. Hence, from the parallax above assigned to the star, it is easy to conclude that its intrinsic splendour is 2.3247 times that of the sun.

Proper Motion of the Sun and Stars. — The so-called "fixed stars" are, in reality, all in motion: and no fixed point—no object absolutely at rest—is to be met with in the whole universe. The power of gravitation, which binds together the numerous members of the solar system, appears to be equally operative among the most distant objects in space. The relative distances of the fixed stars, and even the configuration of the constellations, are imperceptibly altering. Of all the bright stars observed by the ancients, not one has kept its place unchanged. In the case of Arcturus, for example, of *μ Cassiopeiæ*, and of a double star in *Cygnus*, this change of position has, in 2000 years, amounted to $2\frac{1}{4}$, $3\frac{1}{2}$, and 6 moon's diameters, respectively. While some vary only the twentieth part of a second annually, others vary 7.7 seconds,—showing a ratio in their proper motions of 1 : 154. The Southern Cross will not always shine in the heavens in its present form, for the four stars of which it consists are moving in different directions. Even our own sun, so long regarded as stationary in the centre of the system, is found to be in rapid motion through space, and daily traversing a distance of 432,000 miles,—a space exceeding his own radius. Sir W. Herschel arrived at the conclusion, three quarters of a century ago, that he was moving in the direction of λ *Herculis*,—a point in right ascension 260° 34′, and north polar distance 63° 43′, for the year 1790. Otto Struve, from a very elaborate discussion of the proper motion of 392 stars, determined the point, for 1850, to be in right ascension 261° 52′; declination 37° 33′. It will probably, however, be a long time yet before astronomers are in a position to determine whether this motion of our system through space is in a right line or curvilinear; and, if the latter, what that point is around which it is revolving. Dr Mädler of Dorpat has, indeed, hazarded the conjecture that our sun is only one of the millions of stars of the well-known Milky-Way, which consists of a mighty ring, or wheel of stars, greatly crowded together at the circumference, but comparatively few towards the centre. The central group of this grand system, which composes our firmament, is, he thinks, the Pleiades, which revolves round *Alcyone*, the brightest orb of that beautiful constellation. The distance of our sun from that centre of force he calculates at 31,500,000 times the distance of the earth from the sun,—a distance so great that light could not traverse it in less than 500 years, and requiring 18,200,000 years for our sun to complete one

revolution! But however lofty such conceptions of genius may be, they are not, as yet, to be regarded as established scientific truths.

3. FORM, SIZE, AND MOTIONS OF THE EARTH.—Having thus traced the relation of the earth to surrounding worlds, we now return to examine itself more minutely. Its *form* is that which a perfect sphere* of fluid consistency would assume, were it made to revolve around its axis with the same rapidity as the earth does. Such a form is called an *oblate-spheroid*,†—that is, a sphere somewhat flattened or compressed at the poles, like an orange. The larger or equatorial diameter exceeds the polar diameter by 26 miles—the former being 7925, and the latter 7899 miles. In round numbers, the diameter may be stated at 8000 miles; the radius, or semi-diameter, at 4000; the circumference at 25,000; the area, or superficial content, at 197,310,000 square miles; and the volume, or solid content, at 260,613,000,000 cubic miles.‡

Motions of the Earth.—The earth has three motions: first, that referred to above, in accompanying the sun through space (*see* p. 2); second, an *annual* or *orbital* motion round the sun, which it per-

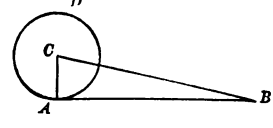
* Among the numerous proofs of the spherical form of the earth, the following may be mentioned:—

1. A much greater extent of the earth's surface is visible from the top of a mountain than from a plain near the level of the sea.
2. As the mariner nears the land, he first sees the tops of the mountains; and on approaching nearer, the lower grounds become visible.
3. In cutting for a canal, it is found that allowance must be made for a dip of about 8 inches per mile, in order to keep the water at a uniform level.
4. In travelling to any considerable distance, either north or south, new stars come to view in the direction in which the traveller is advancing, while others disappear in the direction from which he is receding.
5. Many navigators, who have sailed constantly in one direction, whether due east or due west, have returned to the port from which they set out.
6. The shadow which the earth casts on the moon, during an eclipse, is always circular.
7. All the other members of the solar system are spherical.

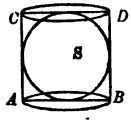
† A *prolate* spheroid, on the contrary, is a sphere somewhat elongated in the direction of its poles, forming a body shaped like a lemon.

‡ Tyros in mathematics may be reminded of the following facts:—

1. The circumference of a circle, or sphere, whose diameter is 1, is = 3.1416, or 3⅐ nearly. Hence, to find the circumference of any other circle, or sphere, multiply its diameter by 3⅐.



2. The area of a circle is found by multiplying its radius by half its circumference. Thus the area of the circle *A D* is equal to the area of the triangle *A B C*, the base of which, *A B*, is = the circumference of the circle. More briefly, area = $\frac{\text{rad.} \times \text{circ.}}{2}$



3. The area of a sphere is equal to the *convex area of the circumscribing cylinder, A B C D;* and its solid content, *S*, is equal to ⅔ of the solid content of the circumscribing cylinder. Or, Area = $D^2 \times 3.1416$.

Solid content = $\frac{\text{rad.} \times \text{area}}{3}$

forms in 365.256 mean solar days; and the third, called its *diurnal* motion, round its own axis, in 1 day, or 24 solar hours.* The *axis* is an imaginary line passing through the earth's centre, and inclined to the plane of its orbit at an angle of 66° 32′. This imaginary line remains always parallel to itself; or, what is the same thing, its extremities, which are called its *poles*, always point to the same fixed stars, and present themselves alternately to the sun,—thus giving rise to the variety of the *seasons*, as the diurnal motion, which is from west to east, causes the alternations of *day* and *night*, and of the rising, southing, and setting of the heavenly bodies. If the axis on which the earth performs her daily rotation were exactly perpendicular to the plane of her path round the sun, one constant climate would characterise the same parallel of latitude at all times of the year, and all the benefits which result to mankind from the regular succession of the seasons would have been wanting; but by the simple arrangement of the axis being inclined 23½° from the perpendicular, the All-Wise Creator has made perpetual provision for the regular recurrence of summer and winter, of seed-time and harvest.

4. MATHEMATICAL DIVISONS OF THE EARTH.—In order to describe with precision the position of places on the earth's surface, and the effects that result from its orbitual and diurnal motions, certain imaginary lines are drawn round it, which are called *great circles* when they divide it into two equal hemispheres, and *small circles* when they divide it unequally.

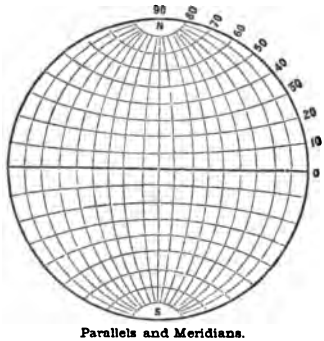
The Great Circles are the Equator, Horizon, Meridians, Ecliptic, and the two Colures.

The **Equator**, a large circle, equidistant from the poles, divides the earth into a Northern and a Southern Hemisphere. The latitude of places is measured *from* it, north and south; and their longitude, *on* it, east and west.

The **Horizon** separates the visible half of the celestial concave from the half that is invisible, and is either *rational* or *sensible*. The rational, or true horizon, by which the rising and setting of all the heavenly bodies are determined, is an imaginary plane passing through the centre of the earth, and prolonged in imagination till it attains the region of the stars. Parallel to it, and coextensive with it, is the sensible horizon, whose plane is a tangent to the surface at the point on which the spectator is placed. These two planes, although separated throughout their whole extent by a semidiameter of the earth, will yet, on account of the vast distance at which that interval is seen, be confounded together, and appear as one line in the heavens. As applied to the earth, however, the sensible or apparent horizon is the small circle which terminates our view of the surface, where earth and sky appear to meet. It enlarges or contracts, according as the spectator's eye is elevated or depressed: thus, if the eye be elevated 6 feet above the sea, the circular expanse of water visible to it will be 3 miles in diameter. The **Cardinal Points** of the horizon are north, south, east, and west; the **Zenith** is the upper pole of our horizon, and the **Nadir** the lower pole.

* But a *sidereal* day, or one measured by the stars, consists of 23h. 56m. 4s. of solar time.

The **Meridians**, or lines of longitude, are great circles passing through the poles, and cutting the equator at right angles. Each of them divides the earth into two hemispheres which, in respect to each other, may be termed east and west. There are 12 meridians commonly drawn on globes, each 15° apart, equal to a difference in time of one hour; and 18 meridians, on maps of the world, each 10° apart, corresponding to a difference in time of 40 minutes. But every place is supposed to have a meridian passing through it; and when the sun comes to that meridian, it is noon or mid-day at that place. The **longitude** of a place is its distance east or west from the **first meridian**, or that one from which we agree to count. This has varied with different nations: thus the French reckon from Paris; the Spaniards, from Cadiz; and the English, from Greenwich. But there is one meridan which has a claim above all others to be regarded as the first—viz., that passing through the Great Pyramid of Jeezeh.* When the latitude and longitude of a place are known, its exact position on the globe may at once be pointed out. The value of a degree of longitude varies according to the latitude, and is nowhere equal to a degree of latitude, except on the equator. At 60° lat. a degree of longitude is equal to 30 geographical miles, or just the half of its length on the equator; while at the poles it vanishes to nothing.



Parallels and Meridians.

TABLE SHOWING THE LENGTH OF A DEGREE OF LONGITUDE FOR EVERY 5 DEGREES OF LATITUDE IN GEOGRAPHICAL AND ENGLISH MILES.

Deg. of Latitude.	Geog. Miles.	Eng. Miles.	Deg. of Latitude.	Geog. Miles.	Eng. Miles.
0	60.00	69.07	50	38.57	44.35
5	59.77	68.81	55	34.41	39.58
10	59.09	67.95	60	30.00	34.53
15	57.96	66.65	65	25.36	29.15
20	56.38	64.84	70	20.52	23.60
25	54.38	62.53	75	15.53	17.86
30	51.96	59.75	80	10.42	11.98
35	49.15	56.51	85	5.23	6.00
40	45.96	52.85	90	0.00	0.00
45	42.34	48.78			

* This meridian passes through a greater extent of land actually inhabited than any other, and, strange to say, it also equally divides the entire habitable globe.

The **Ecliptic** is a great circle, which represents the sun's apparent annual track among the fixed stars. It derives its name from being the circle on or near which the moon must be in the case of an **eclipse.** Its plane makes an angle of 23½° with the plane of the equator. The sun is in the north, or highest point of the Ecliptic, on 21st June; and he is then vertical at the tropic of Cancer; he is in the south, or lowest point, on 21st December, and is then vertical at the tropic of Capricorn. The Ecliptic is divided into twelve equal parts, called **signs,** of 30° each, named from the constellations or groups of stars through which the sun appears successively to pass. These, with the days on which the sun enters them, are as follows :—

Aries, March 21.	*Spring.*	Libra, Sep. 23.	*Autumn.*
Taurus, April 19.		Scorpio, Oct. 23.	
Gemini, May 29.		Sagittarius, Nov. 22.	
Cancer, June 21.	*Summer.*	Capricornus, Dec. 22.	*Winter.*
Leo, July 22.		Aquarius, Jan. 20.	
Virgo, Aug. 22.		Pisces, Feb. 19.	

The **Colures** are two meridians which divide the Ecliptic into four equal parts, making the four Seasons of the year. One of them intersects the equinoctial points, Aries and Libra, and is thence called the Equinoctial Colure; the other intersects the solstitial points, Cancer and Capricorn, and is called the Solstitial Colure.

The Small Circles are the Tropics, the Parallels of Latitude, and the Polar Circles.

The **Tropics** are two small circles parallel to the equator, and at the distance of 23½°, north and south. They are so named because the sun, arrived at them in his apparent annual course, seems to *turn away,* either northward or southward, as the case may be. The northern is called the Tropic of Cancer, and the southern the Tropic of Capricorn, because they touch the ecliptic in the beginning of those signs.

The **Parallels of Latitude** are small circles parallel to the equator, the object of which is to indicate the latitude of places, and to connect together all places on the globe having the same latitude. Though on globes and maps of the world they are usually drawn at intervals of 10°, every place is supposed to have a parallel of latitude passing through it.

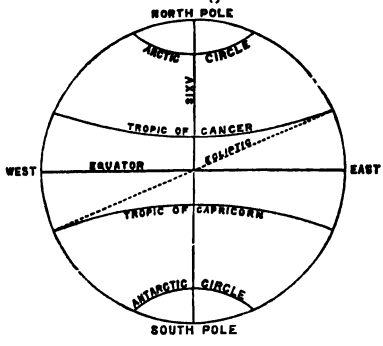
The **Polar Circles** are two small circles, drawn around the North and South Pole respectively—the former being called the Arctic, and the latter the Antarctic Circle. Their distance from the Poles is 23½°, that being the angle formed by the earth's axis and a line drawn perpendicular to the earth's orbit. When the sun is vertical to places situated on the Tropic of Cancer, his rays extend beyond the Pole to the Arctic Circle, and all countries within the Antarctic Circle are then in darkness.

Zones.—The Tropics and Polar Circles divide the surface of the earth into five great Climatal Zones or Belts—viz.:

1. One **Torrid Zone,** 47° in breadth, or 23½° on either side of the Equator, and bounded by the Tropics of Cancer and Capricorn.

Every place in this wide region has the sun vertical to it twice a-year; and as the sun's rays never fall very obliquely on any part of it, the temperature at the surface of the earth is here always very high.

2. Two **Temperate Zones**, one northern and the other southern, each 43° in breadth, lying between the Tropics and the Polar Circles. Never having the sun vertical, they are characterised by a lower temperature than tropical regions; the fruits of the earth are less luxuriant and spontaneous; and man, compelled to exercise his corporeal and thinking powers, attains to a higher degree of intelligence and civilisation than in those regions where his wants are supplied without any exertion on his part.



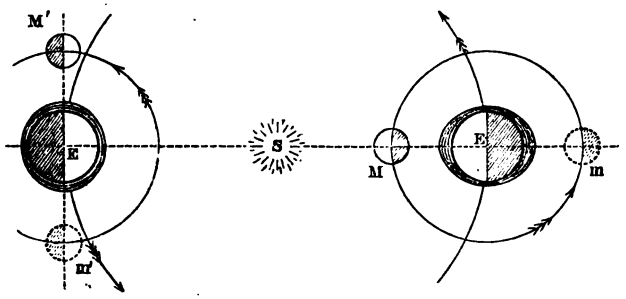
Zones and Circles.

3. The Two **Frigid Zones**, each 23½° in radius, are included within the Polar Circles. They are deprived of the influence of the sun for long intervals in winter, and have a correspondingly greater length of day in summer, when his rays fall very obliquely on the surface. These conditions, coupled with the extreme cold of the long winters, are so unfavourable to human culture and human happiness, that the tribes who inhabit the frigid zone have not been able to attain to any considerable degree of civilisation.

The Moon, or the Earth's Satellite.—The earth, on her annual journey round the sun, is attended by a moon or satellite, which revolves round her in the same way as the former does round the central luminary. Of the five planets and numerous planetoids situated between the centre of the system and the orbit of Jupiter, the earth alone enjoys the advantage of such a companion; while all the other planets possessed of satellites are not only of vastly greater dimensions, but also greatly farther from the sun. The mean distance of the moon from the earth is 239,840 miles, or little more than half the sun's radius, and she performs her revolution round her primary in one lunar month of 29 days, 12 hours, 44 minutes. It is a remarkable fact that this is also the precise time in which she rotates round her own axis. Hence, at all times, the moon presents very nearly the same face to the earth. The time of her rotation is much longer than that of any of the planets; but, so far as yet ascertained, all the other satellites belonging to our system follow the same law—that is, they rotate on their axes in the same time as they revolve around their primaries. Unlike the sun and fixed stars,

which are self-luminous, the moon, in common with all the planets and satellites, shines by reflected light derived from the central luminary. Her orbit is inclined to that of the earth at an angle of 5° 9′, but for which we should have an eclipse of the sun and moon alternately every fortnight. There is a *total* eclipse of the sun when the moon is near the earth, and the sun, earth, and moon in the same straight line; and an *annular* eclipse when, being more remote from the earth, her apparent diameter is less than that of the sun. The surface of the moon presents the aspect of a volcanic wilderness, being interspersed with enormous crateriform mountains, dykes, and lava streams, while no diversities of sea and land are discernible.

Tides.—The moon's attractive energy (aided by that of the sun at new and full moon) raises the waters of the ocean into a great tidal wave, which seems to follow the satellite in her path through the heavens. This attraction, however, directly accounts for only one high tide at any place every lunar day of 24 hours, 50 minutes; whereas, in reality, there are two high tides, occurring at intervals of 12 hours, 25 minutes. The other takes place at the same instant, but on the opposite side of the earth's surface, and is caused by the moon drawing towards her the nearer or solid part of the planet with greater force than the more distant waters.



When the moon is in the position M (*new moon*), or at *m* (*full moon*), it acts *in conjunction* with the sun. The tides on both sides of the earth are then at the highest, and are called Spring Tides. But when the moon is at M′ (*first quarter*), or at *m′* (*last quarter*), the waters rise the least, as the attraction of the sun, acting at right angles to that of the moon, considerably neutralises the effect of the latter, and produces what are known as Neap Tides.

PART II.

PHYSICAL GEOGRAPHY

1.—MATERIALS, DENSITY, AND ATTRACTIVE POWER OF THE EARTH.—Of the interior of the planet which we inhabit we know almost nothing, our observation being confined to a portion of its external crust, or rind, rarely exceeding 14 miles in depth, or $\frac{1}{315}$ of the distance from the surface to the centre. Even this insignificant distance is attained by adding the height of the loftiest known mountain to the depth below the sea-level of the deepest ocean sounding (p. 22). The Geologist, however, without penetrating beneath the surface, but by carefully examining the order of superposition of the stratified rocks, has made us more or less acquainted with a depth of about 25 miles. Small as this portion is, when compared with the immense volume enclosed by it, it presents to our view a vast variety of substances, each of which has a character peculiar to itself. On examination, they are nearly all found to be *compound bodies*, which, on being analysed, are reducible to 65 *constituent elements.*

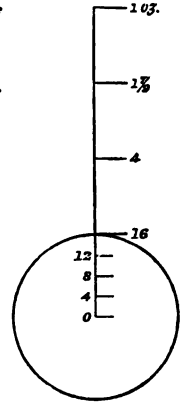
Constituents of the Earth's Crust.—These 65 elements the chemist divides into two groups,—the *Metallic* and the *Non-metallic.* The metals are 52 in number, the best known of them being gold, silver, copper, iron, lead, tin, zinc, and mercury; while the metalloids, or non-metallic class, consists of only 13, the principal of which are oxygen, hydrogen,* nitrogen, carbon, sulphur, and phosphorus. Each of these elementary substances has properties peculiar to itself; and, what is more remarkable, on each of them the Creator has stamped, in deep and indelible characters, a *particular number*, which forms, as it were, the law of its being, and determines in what proportions it shall combine with other substances. This *law of definite proportions* serves in the mineral kingdom the same end as the laws which regulate the propagation of species in the vegetable and animal kingdoms; the identity of species is rigidly preserved, and, notwithstanding the prodigious number of combinations, all confusion is avoided.

Density of the Earth.—Each of the 65 elementary substances has a *density* or *specific gravity* peculiar to itself, ranging from hydrogen, which is the lightest, to platinum, which is the heaviest; but the resulting mean density of the Earth is 5.7 the weight of its own

* From recent experiments by the late Professor Graham of London University, it would appear that hydrogen must now be regarded as a metal.

bulk of distilled water at the temperature of 68°. Thus, while the specific gravity of Mercury is nearly a fourth greater, that of Venus and Mars is nearly equal, while that of the Sun and Jupiter is four, Uranus five, and Neptune six times less. As the specific gravity of the substances forming the crust of the Earth rarely exceeds 3, the obvious inference seems to be, that the interior of the planet cannot be hollow, but, on the contrary, must consist of metals, or of other materials, in a highly condensed and incandescent state.

The **Attractive Energy** which the Earth exercises on all material substances near its surface is such that, when freely suspended, they are drawn towards it with a velocity of 16 feet in the first second of time; *three* times 16 feet the next second; *five* times 16 feet the third second; and so on, following the order of the odd numbers of the scale. Comparing the Earth, in this particular, with the other planets, we find that bodies falling towards the surface of Mars descend with only a fourth of this velocity; while in Jupiter the velocity is two and a half times greater. At great elevations above the surface the intensity of the force of gravitation decreases in the *inverse ratio of the square of the distance*. Thus, a body which (in a spring balance) weighs 16 ounces at the surface, will weigh only 4 ounces at the distance of two semi-diameters from the centre, or one semi-diameter above the surface; while at the distance of four semi-diameters it will weigh only 1 ounce. *Under* the surface the law of decrease is very different, it being there *directly as the distance* from the centre. Thus, at one thousand miles below the surface the body will weigh 12 ounces; half-way towards the centre, 8 ounces; at the distance of a thousand miles from the centre, 4 ounces; while at the centre the pressure on the balance will be nothing. The accompanying diagram will render these observations more intelligible to the pupil.



2. CONFIGURATION OF THE SURFACE.—The terraqueous globe must be supposed to have assumed its present spheroidal form when rotating in its primitive incandescent state. This form the vast collection of waters now on its surface powerfully tends to perpetuate—*first*, by their capacity of yielding to the centrifugal force arising from the planet's rotatory motion; and, *secondly*, by their filling up innumerable depressions in its crust—depressions which, it is now certain, exceed in depth the highest elevations of the land. These elevations very rarely amount to the $\frac{1}{760}$ part of the radius, and, therefore, scarcely interfere with the regular form of the planet. In fact, the mountain-chains on the globe produce no greater deviation

from its spheroidal shape than the small protuberances on the rind of an orange do on its general form.

Division into Land and Water.—The surface of the earth, which, as we have already seen, comprises an area of 196,712,850 square miles, is very unequally divided into land and water. The total area of the land is estimated at 52,000,000 sq. m., or a little more than $\frac{1}{4}$ of the entire surface; while the waters cover 144,712,850 sq. m., or nearly $\frac{3}{4}$ of the whole. The land is, moreover, very unequally distributed over the surface: thus, the northern hemisphere contains three times as much land as the southern; the eastern hemisphere, or Old World, contains twice as much as the western; and if a great circle be drawn round the globe, having London as its centre, it will divide the surface in such a way as that nearly all the land will be in one hemisphere—which may therefore be called the *continental hemisphere;* while the other, or that which has Antipodes Island, near New Zealand, as its centre, will be nearly all water, and may therefore be called the *oceanic hemisphere*—only that it contains Australia and a portion of South America. If we regard the earth as divided into zones instead of hemispheres, we find that the North Temperate Zone, or that in which the continent of Europe is situated, is the one which contains the greatest proportion of land.

Continents.—The land surface of the globe is further broken up into huge masses, called continents, which are six in number—viz., Europe, Asia, Africa, North America, South America, and Australia, but should Antarctica turn out to be a continent, the number will be seven. These, however, are not always detached from each other, but collected into groups, the members of which are generally united by isthmuses. Properly speaking, there are only three continents—viz., *first*, the Old World, containing Europe, Asia, and Africa; *second*, the New World, embracing North and South America; and *third*, the Australian continent—the only important mass of land in the oceanic hemisphere, with the exception of the recently-discovered countries within the Antarctic Circle (*see* p. 26). Of these grand continents the eastern or Old World is by far the largest and most important, having an area of 32,800,000 sq. m., a maritime coast-line of 60,000 m., and a pop. of 1,288,000,000. The area of the western continent, or New World, is 16,000,000 sq. m., being almost exactly $\frac{1}{2}$ of the former; its pop. 82,000,000, or $\frac{1}{16}$ of the Old World; while its coast-line is only 32,000 m., or but little more than $\frac{1}{2}$ of the Old World. Australia has an area estimated at 3,000,000 sq. m., being $\frac{1}{6}$ of the western continent, and a population of 1,398,000, or $\frac{1}{60}$ of America.

Contour and Elevation.—The following are some of the comparisons, equally interesting and curious, that have been drawn by Carl Ritter and other geographers between the two great continents, in respect to their forms of *contour* and *relief*:—

1. The greatest length of the Old World is from east to west, while that of the New is from north to south; in other words, the eastern continent has its greatest extension in the direction of the *parallels*, while

the western has its greatest extension in the direction of the *meridians*. 2. The greatest extension of both continents towards the north and south is nearly under the same meridians. Thus, the Cape of Good Hope is nearly in the same meridian with Cape Nordkyn in Norway; the peninsula of Malacca with Cape Severo in Siberia; and Cape Horn with the north-west angle of Greenland. The last-mentioned country, however, is now known to be detached from the North American continent. 3. Both continents attain their greatest extension from west to east along the same parallel—viz., that of 50° N. 4. Both continents spread out widely towards the north, where they closely approach each other; both are abruptly terminated by the Arctic Ocean in nearly the same latitude —viz., that of 72°; whereas toward the south they widely diverge, and narrow down to single promontories. 5. In either continent a large portion of the area is nearly detached from its principal mass: thus Africa is nearly severed from the one continent, and South America from the other. 6. All the great peninsulas of both continents follow a southerly direction; as the Scandinavian, Spanish, Italian, Hellenic peninsulas, Africa, Arabia, Hindostan, Further India, Corea, and Kamtschatka, in the one; and Alaska, California, South America, Florida, and Nova Scotia, in the other. The only important exceptions to this generalisation are Jütland in the Old World, and Yucatan in the New, both of which stretch *northward;* and Asia Minor in the former, and Russian America in the latter, which project towards the *west*. 7. The opposite coasts of the two grand continents are strikingly conformable to each other, the projections of the one being opposite to the indentations of the other, though separated by the breadth of the Atlantic: thus Brazil stands opposite to the Gulf of Guinea; Western Africa to the Gulf of Mexico; Nova Scotia to the Bay of Biscay; while the opposite coasts of Greenland and Norway are nearly parallel. 8. Looking at the two continents in another way, we find that Africa with Madagascar has its counterpart in South America with the Falkland Isles; while Florida and the West Indies have a similar correspondence with Malacca and the East Indian Archipelago. 9. Taking the six separate continents, it is a remarkable fact that, with the exception of Africa, they all present to the ocean on their northern sides broad flats of low-lying land; while their southern extremities are rocky, pointed, and elevated. Again, while Africa, South America, and, we may almost add, North America, contract toward the south into single promontories, each of the others sends out three separate projections, which curiously correspond, each to each. Thus the Spanish peninsula resembles Arabia; Italy with Sicily corresponds to India with Ceylon; and the Hellenic peninsula, with its adjacent islands, to Further India with the Malay Archipelago. 10. But the most important feature of configuration is that which has reference to their comparative lengths of *coast-line*. While the three southern continents present to the ocean an almost unbroken outline, neither receiving its waters into their bosoms nor projecting into it any important peninsulas, the three northern ones are highly indented, though in very different degrees, their masses evincing a tendency to break up into members. Thus, while Asia and North America has each an extensive line of coast, Europe has wholly surrendered herself to the ocean, as if conscious that, at a future time, that element would become one of the chief sources of her prosperity.

Vertical Relief.—In regard to the lines of vertical relief, on the other hand, the following are the most important generalisations:—

1. All the continents rise gradually from the sea-shore towards the in

terior, where they attain their maximum elevation; and thus each of them presents to the surrounding ocean two great slopes, which greatly differ, however, in length and degree of inclination. 2. In the Old World, the long gentle slope is inclined toward the north, and the short abrupt slope toward the south; while in the New World the gentle slope is toward the east, and the abrupt toward the west. 3. But while each of the grand continents has thus a law peculiar to itself, it is also influenced by the law of the other. Thus, though in the Old World the long or gentle slope is toward the north, and the short or abrupt one toward the south, it is also true that the slope fronting the east is more gradual than that fronting the west. In like manner, though in the New World the longer slope fronts the east, and the shorter the west, it is also true that the slope which fronts the north is gentler than that which fronts the south. 4. The elevated ridge formed by the intersection of the great slopes or *watersheds* is usually occupied by lofty mountain-chains, and constitutes the grand *water-partings* of the different continents. Hence in the Old World the general direction of the principal mountain-ranges is from east to west, while in the New it is from north to south; while in both they extend in the direction of the *greatest length* of the continents. Thus, in the eastern continent, one immense mountain-chain extends, with few interruptions, from the western extremity of the Pyrenees to the vicinity of Behring Strait; while in the western, an almost unbroken range extends from the north-east angle of Alaska to the southern extremity of Patagonia. 5. This law holds equally true in regard to all the more important peninsulas and islands. Thus Scandinavia, Italy, Malacca, Corea, Kamtschatka, and Lower California, together with Great Britain, Corsica, Sardinia, Sicily, Crete, Madagascar, Sumatra, Java, Japan, Cuba, Hayti, Jamaica, and New Zealand, are all traversed by mountain-ranges in the direction of their greatest lengths. 6. While in both hemispheres the reliefs go on increasing from the poles to the equator, the highest elevations of the eastern hemisphere occur in the vicinity of the Tropic of Cancer, while in the western they are found near the Tropic of Capricorn: compare the positions of Mount Everest, in the Himalaya, with that of Aconcagua, in the Andes. 7. A remarkable similarity exists between Europe and Asia in respect to their reliefs. Thus the Pyrenees and Alps correspond with the Taurus, Caucasus, and Himalayan ranges; the basin of the lower Danube has its counterpart in Tonquin; European Turkey corresponds with Further India; Venetian Lombardy with the basin of the Ganges; while Delhi, Calcutta, and Bombay at once suggest Milan, Venice, and Genoa. 8. Notwithstanding the imposing height of the various mountain-chains, the mean elevation of the continents depends far less on this than on the general configuration and extent of the plains and table-lands. For example, if the entire mass of the Alps were pulverised and distributed over the whole extent of Europe, its surface would not thereby be raised more than 22 feet above its present level; while, on the contrary, were the great plateau of Spain, which has an elevation of only 2000 feet, levelled down and spread in a similar manner over the continent, the general surface would be raised 76 feet. Taking each of the continents separately, the average elevation of Europe would be 671 feet; of North America, 748 feet; of South America, 1132 feet; and of Asia, 1151 feet: and it is estimated that if all the inequalities of the earth's surface were reduced to a uniform natural level, the land would have an elevation above the sea-level of 925 feet. If these data could be relied on, the real level of the earth's surface, as distinguished from that of the sea, could

be approximately estimated at 230 feet higher than the present sea-level.*

3. THE OCEAN.—About 144,712,850 square miles, or nearly three-fourths of the entire superficies of the globe, are permanently covered with water, the surface of which forms a true *natural level*, all the parts of which are nearly equidistant from the earth's centre. Such a level, in the case of a rotating body like the earth, the materials of which were once capable of yielding to the influences of gravity and of the other forces that acted upon it, is of a spheroidal form, like that of an orange, and differs materially from a dead, horizontal level, such as the floor of an apartment. The surface of lakes, deserts, plains, and even of the continents, conforms itself to this natural level; it forms the limit from which all the elevations of the land and the soundings of the ocean are measured; and, in constructing a canal or a railway along the surface, an allowance must always be made for this difference, amounting to about 8 inches in the mile. The waters of the ocean are salt and bitter, their density varying according to the quantity of saline matter they contain. The quantity of salt, the origin of which is unknown, varies in different places from 3.5 to 4.5 per cent. The surface temperature of the ocean varies with the season of the year and with latitude. Below 100 fathoms, however, the temperature is not affected by these causes. By numerous experiments in 1869 (conducted by Professor Wyville Thompson, Mr Gwyn Jeffreys, and Dr Carpenter, in H.M.S. Porcupine, in the North Atlantic), it was found that the temperature rapidly declines from the depth above specified till we reach 1000 fathoms, when it sinks to 38° Fahr., whilst at 2435 fathoms it was only 36°.5. Strange to say, at a corresponding depth in tropical seas, it is only 30° Fahr. The same explorers also found (contrary to all former ideas on the subject) that animals of many orders and genera—some of them, too, of very high organisation—exist at the profoundest depths of the ocean. Sponges, annelids, molluscs, echinoderms, and crustaceans, have already been found in vast numbers. One expedition alone has added 127 species to the molluscs already known to exist in British waters. These, doubtless, are to be regarded as mere prognostications of a new world about to be revealed to naturalists.

The **Atlantic Ocean** deserves the first place, for though less than half the size of the Pacific, it is the best-known to Europeans; and of all the great waters of the globe it has always been the most important, as that on whose shores and gulfs the greater number of the civilised nations of the earth have taken up their abode. It occupies a huge, angular, canal-shaped basin, whose sides are nearly parallel

* It may be interesting to remember that the Great Pyramid indicates the correct number as 215 feet—that being the height of its base above the sea.

to each other—the projections of the one side standing opposite to the indentations of the other; extends from N. to S. about 9000 miles; separates the Old World, on the east side, from the New on the west; and connects the Arctic with the Antarctic Ocean. It varies greatly in breadth in different parts, being 4100 miles between the shores of Marocco and the Isthmus of Florida; 1700 miles between Brazil and Sierra Leone; and 900 miles between Greenland and the coast of Norway. The *area* is estimated at 35,000,000 square miles, or nearly half the area of the Pacific. It is distinguished from all the other oceans by the great depth of its waters; by the fewness of its islands; and by the great number of seas and gulfs which it projects into the continents that confine its waters. It varies greatly in *depth*, from 300 fathoms near the shores to 46,000 feet in the latitude of the Azores; while at midway between Tristan d'Acunha and Buenos Ayres, and near the middle of the South Atlantic, Captain Denham, of H.M.S. Herald, found the bottom at a depth of 7706 fathoms, or 8¾ miles—being the greatest ocean-depth hitherto ascertained. A remarkable steppe, or raised bottom, occurs between Ireland and Newfoundland, which is now known as the Telegraphic Plateau, being that on which rest the great submarine telegraphic cables which unite Europe with America.

The principal **Branches** of the Atlantic are the Baltic, the North Sea, the Irish Sea, the English Channel, the Bay of Biscay, the Mediterranean, and the Gulf of Guinea, on the east side; and Hudson Bay, Gulf of St Lawrence, Gulf of Mexico, and the Caribbean Sea, on the west. The principal **Islands and Archipelagos** are, Iceland, the British Isles, Azores, Madeira, Canary and Cape Verd Isles, near its eastern shores; and Newfoundland, Cape Breton, Bermudas, Bahamas, Antilles, and the Falkland Isles, near its western. Its chief **Affluents** from the Old World are the Neva, Rhine, Loire, Tagus, Rhone, Po, Danube, and Don; Nile, Senegal, Niger, Congo, and Orange; and from the New World, the St Lawrence, Mississippi, and Rio Grande del Norte; the Orinoco, Amazon, and Rio de la Plata. Among its principal **Currents** are, the Equatorial Current, which flows from the coast of South Africa to the Caribbean Sea, with a velocity of from 30 to 70 miles a-day, and a temperature of 80°; and the far more celebrated Gulf Stream, which, leaving the Gulf of Mexico, flows through the Strait of Florida with a velocity of 80 miles a-day, and a mean temperature of 81° Fahr. "After having run 3000 miles towards the north, it still preserves, even in winter, the heat of summer. With this temperature it crosses the 40th degree of north latitude, and there overflowing its liquid banks, it spreads itself out for thousands of square leagues over the cold waters around, and covers the ocean with a mantle of warmth that serves so much to mitigate in Europe the rigours of winter. Moving now more slowly, but dispensing its genial influences more freely, it finally meets the British Islands. By these it is divided, one part going into the polar basin of Spitzbergen, the other entering the Bay of Biscay, but each with a warmth considerably above the ocean temperature." The **Trade-Winds** blow regularly in its intertropical regions; but beyond these limits the winds are variable. Thus we see that the waters of the Atlantic between the equator and the 40th parallel are kept in a perpetual whirlpool, the circumference of which cannot be less than from eleven to twelve thousand miles. In the centre of this

revolving current there is a mass of nearly stagnant water, covered by dense masses of an evergreen sea-weed, called *Fucus Natans*, which made so lively an impression on the mind of Columbus and his crew when about to discover America in 1492.

The **Pacific Ocean** separates America on the east, from Asia, Malaysia, and Australia on the west; and is by far the grandest expanse of water on the globe, having an area estimated at 72,000,000 square miles, or equal to one-half the entire waters of the globe. Unlike the Atlantic, of which it is fully double the size, its greatest length is from E. to W. along the equator—a direction in which it extends 175°, or upwards of 12,000 miles, reckoning from the coast of Peru to the Malay peninsula. Its greatest breadth, between Behring Strait and the Antarctic Circle, is 9000 miles, corresponding with the extreme length of the Atlantic. Its shape is somewhat oval, being widest in the middle and contracting towards both extremities, especially in the north, where the opposite shores are only 36 miles apart. The Pacific Ocean was unknown to Europeans till the year 1513, when it was discovered by *Vasco Nunez de Bilbao*, from the summit of a mountain near the Isthmus of Panama. *Magalhaens*, who sailed from America to the Philippine Islands, in 1521, bestowed on it the name of Pacific, in consequence of the calm and delightful weather he experienced while navigating its surface.

The coast-line, on the American side, though bold, is very little indented by the ocean, the principal **Inlets** and **Branches** being, Behring Sea, or the Sea of Kamtschatka, the Gulf of California, and Bay of Panama; while of those on its western side the chief are, the Sea of Okhotsk, Sea of Japan, Yellow Sea, China Sea, and Gulf of Siam, with the Gulf of Carpentaria in Australia. This ocean is especially characterised by the immense number of **Archipelagos**—many of which are of volcanic, and others of submarine coral formation—that are scattered over its surface, especially in its western and central parts. North of the Tropic of Cancer the principal groups are, the Japan Isles, Kurile Isles, Aleutian Isles, Queen Charlotte's Island, and Vancouver Island. South of the Tropic of Cancer, and proceeding from W. to E., we find Malaysia, or the Malay Archipelago, the Ladrones, Caroline Isles, Marshall Archipelago, Sandwich Isles, and the Galapagos Islands near the South American coast. Then returning westward, we come to the Marquesas, Low Archipelago, Society Islands, Hervey or Cook's Islands, Navigators' Islands, Friendly Islands, Feejee Islands, Queen Charlotte's Islands, Saloman Isles, New Hebrides, New Caledonia, and New Zealand. Its chief **Affluents** from the Old World are, the Amour, Hoang-Ho, Yang-tse-Kiang, Cambodia, Meinam; and from the New World, the Frazer, Columbia, and Colorado. The principal **Current** of this ocean is called the Equatorial Current, which, originating in the Antarctic Drift Current, flows N. along the western shores of South America to the coast of Peru, and then W. through the Pacific, where it occupies the entire space between the tropics, producing a genial coolness, where otherwise the heat would be almost insupportable. Opposite Lima, on the Peruvian coast, its temperature is 14° below that of the neighbouring ocean; and even at Payta, which is 7 degrees farther N., it is 10° colder than the sea in its vicinity. Farther W. it gradually loses its cooling powers, which, however, are perceptible to the vicinity of the Marquesas.

The **Indian Ocean** separates Malaysia, Australia, and Tasmania, on the east, from Arabia and Africa on the west; its northern boundary is formed by the shores of India and Biluchistan, and its southern, by the Antarctic Circle. Its shape would have approximated to an equilateral triangle, had not Asia projected its hugest peninsula into its apex, and given it a very irregular form. Extending from a little beyond the Tropic of Cancer to the Antarctic Circle, its greatest length is 90°, or about 6000 miles; while its extreme breadth, from Cape Agulhas to Tasmania, is expressed by the same number. The area is generally estimated at 25,000,000 square miles, or 20,000,000 when its southern boundary is formed by a line connecting South Cape in Tasmania with Cape Agulhas in Africa.

In proportion to its magnitude it equals even the Atlantic as to the number and extent of the **Branches** which it sends into the land, especially on its northern frontier. The principal of these are the Bay of Bengal; the Arabian Sea, with its members, the Gulf of Kachh, Gulf of Oman, and the Persian Gulf; the Gulf of Aden with the Red Sea; the Channel of Mozambique; Encounter Bay, St Vincent Gulf, Spencer Gulf, and the Great Australian Bight, in Australia. The only **Islands** of considerable magnitude are Ceylon and Madagascar; but smaller islands and archipelagos are numerous, as Bourbon, Mauritius, Comoro, Amirantes, Seychelles, Socotra; the Laccadive, Maldive, and Chagos archipelagos; Rodrigues; the Andaman, Nicobar, and Mergui archipelagos; Keeling Islands; St Paul and Amsterdam; Kerguelen or Desolation Island, &c. Its larger **Affluents** are nearly all from the Asiatic continent, as the Irawadi, Brahmaputra, Ganges, Mahanadi, Godaveri, Krishna, Tapti, Nerbudda, Indus, and Euphrates; together with the Zambezé from Africa, and the Murray from Australia. The waters of the Indian Ocean being as hot as even those of the Gulf of Mexico, several warm **Currents** flow out of it in various directions. One of these originates in the Bay of Bengal, and after passing through the Strait of Malacca, unites with other warm currents from the Java and China seas, and then flows out into the Pacific like another Gulf Stream—to which, indeed, both in its direction and effects, it bears numerous and striking resemblances. Another current, from the Arabian and Red Seas, flows southwards between Africa and Madagascar, till it meets the Cape Current from the Atlantic, south of Cape Colony. The latter current, formerly supposed to be flowing northward along the west coast of Africa, is now ascertained to be flowing southward, till, after uniting with the Mozambique current, both find their way into the intensely cold waters of the Antarctic Ocean.

The **Arctic Ocean**, or north polar basin, is bounded in general by the northern shores of Europe, Asia, America, and Greenland, all of which remarkably conform to the parallel of 72°; and hence its form is nearly circular, and its usual breadth 2500 miles. In other directions it is bounded by the Arctic Circle, which separates it from the Atlantic and Pacific Oceans, and forms the northern limit of sunshine in winter. Its greatest length from Behring Strait to that point on the Norwegian coast at which the Arctic Circle cuts the land—that is, along the meridian of 12½° E.—is 3240 miles; and the total area is estimated at 5,000,000 square miles. Except on the Atlantic side, the waters of this ocean are virtually land-locked,

the outlet by Behring Strait being only 36 miles wide, with a maximum depth of 25 fathoms. Its most practicable entrance for ships is between Norway and Iceland, that being the path pursued by the north-east branch of the Gulf Stream; the remainder of the opening towards the Atlantic being either occupied by Greenland and innumerable other islands, or blocked up by gigantic icebergs. The highest latitude hitherto attained in this ocean is that of 82° 55′, being only 7° from the North Pole—a point which in all likelihood will soon be reached, as the ocean is usually open to ships, and contains no trace of a continent like that which probably surrounds the South Pole. The long sought *North-West Passage*—that is to say, a navigable passage from European countries to China along the northern coast of America—was at last, after innumerable unsuccessful efforts continued for two centuries, effected by Captain Maclure, who, in 1856, achieved the hazardous task by sailing out of the Pacific through Behring Strait; then, turning eastward, pursued his course along the coast till he came to Cape Bathurst, at the entrance to Coronation Gulf; then northward, along the west coast of Banks' Land to Melville Sound, which he entered; and continued his dangerous voyage eastward to Baffin Bay and Davis Strait; and finally entered the Atlantic. It now appears, however, that the honour of the discovery is really due to Sir John Franklin, who left England in search of a north-west passage in 1845, but who perished with all his crew in 1847. Notwithstanding the success of this brilliant exploit, the route thus discovered is all but absolutely impracticable, and can never be of any avail in a commercial point of view; while the same route in the opposite direction remains still unaccomplished.

The principal **Branches** of the Arctic Ocean are, the White Sea, in Europe; the Gulfs of Kara, Obi, and Yenisei, in Asia; Behring Strait, between Asia and the New World; and Coronation Gulf, Melville Sound, Barrow Strait, Lancaster Sound, and Baffin Bay, in North America.

The **Rivers** that find their way into this ocean are, for the most part, of great magnitude. Having their sources as far south as the 50th parallel, in both hemispheres, they drain an area fully equal to that of the ocean which they enter, or considerably more than that of the continent of Europe. The chief of those from the Old World are the Dwina, Petchora, Obi, Yenisei, Lena, and Kolyma; and from the New World, the Colville, Mackenzie, and Coppermine. The northward direction of these rivers imparts a striking peculiarity to the annual thawing of their waters. As their upper courses belong to more temperate latitudes than their lower, the former are melted by the heat of the sun at an earlier date than the latter, and discharge their liberated contents into the valleys and estuaries below, which, being thus inundated by waters of a comparatively elevated temperature, speedily give way in turn; and thus, in a comparatively brief period, the entire ocean is covered with an immense volume of fresh water of more than 32° of temperature, which now becomes the prime mover of that **ocean-current** that, every summer, drifts the polar ice into the Atlantic. Another cause, however, co-operates in producing this phenomenon. The north-east branch of the Gulf Stream from the Atlantic enters the Arctic Ocean between Norway on the one side, and Iceland and Spitzbergen on the other. Doubling

the North Cape, it flows eastward, close to the shores of Lapland and Siberia, the rigorous climate of which it materially softens. Arriving at Behring Strait, it is greatly increased in volume and force by the Japan current from the Pacific, and now pursuing its circuitous journey, it eventually arrives at Banks' Land and the Parry Islands. The **Islands** of this ocean are but imperfectly known. They are for the most part uninhabited, and are important only as the temporary abodes of the whale, seal, and walrus hunter. The principal groups are the following: Spitzbergen, Novaia Zemlia, and New Siberia, between the Pole and the Eastern Continent; and the great North American Archipelago, the chief members of which are the Parry Islands, Banks' Land, Boothia Felix, Cockburn Island, Cumberland Island, Cornwallis Island, North Devon, Ellesmere, and Greenland.

The **Antarctic Ocean** is far less accurately known to geographers than any of the other great oceanic basins, the cold being more intense, the winds and seas more boisterous, and the ice extending at least 10° degrees nearer the equator than in the Arctic Basin. The highest latitude yet attained in this ocean was reached by Sir James Ross, who, in 1841, penetrated to lat. 78° 4′, or within 815 miles of the South Pole. In this latitude, and immediately S. of New Zealand, his progress southward was arrested by an ice-bound shore, on which he landed, and which, in honour of his sovereign, he named South Victoria Land. Other navigators, in approaching the pole from other directions, have encountered similar obstructions at considerably lower latitudes, as Adelie Land, S. of Australia; Enderby Land, S. of Madagascar; and South Shetland, S. of Cape Horn. Probably, therefore, almost the entire area embraced by the Antarctic Circle is occupied by a continent which is nearly circular in form, and more than twice the size of Australia; which is covered by eternal snows, and wholly devoid of vegetation; the shores of which are guarded by gigantic volcanoes, or by impenetrable barriers of ice; and whose interior has never been trodden by the foot of man. One of these volcanoes, named Mount Erebus, was found by Sir James Ross to be 12,400 feet above the level of the sea, and in a state of constant activity; while Mount Terror, an extinct volcano, has an altitude of 9000 feet. The seas around this continent are remarkably shallow, the depth rarely exceeding 400 fathoms. The temperature of the hottest month, even at the level of the sea, ranges from 11° Fahr. to the freezing-point of water. The **barometric pressure** is also greatly less than in tropical regions (*see* p. 28). Sir James Ross determined the position of the **South Magnetic Pole** to be within the limits of South Victoria Land—viz., in lat. 75° 5′ S., and lon. 145° 8′ E.

4. THE ATMOSPHERE.—Many of the phenomena of physical geography are inexplicable without some previous acquaintance with that thin, aerial, and invisible fluid called the Atmosphere, which envelops the earth on all sides, which shares in its diurnal motion, and which accompanies it in its annual journey round the sun. In respect to **composition**, atmospheric air

consists almost exclusively of two gaseous, elementary substances, oxygen and nitrogen, in the proportion of 21 parts by volume of the former, and 79 parts of the latter, or, 23 parts by weight of oxygen, and 77 of nitrogen. It also contains a little carbonic acid gas, a minute though very variable quantity of aqueous vapour, and a trace of ammonia. The oxygen and nitrogen are not chemically combined, but exist in a state of *mixture;* yet their relative proportions remain invariable, being the same on the summits of the highest mountains as in the deepest recesses of the surface, the same in the country as in the crowded city, and the same in the tropical as in the frigid zones. On the contrary, the carbonic acid and vapour of water vary greatly in quantity in different localities, the one being affected by local causes, and the other mainly by changes of temperature.

Pressure of the Atmosphere.—Notwithstanding its extreme lightness, the air, in common with all other material bodies, is affected by the all-pervading law of gravitation, and exerts a pressure on the surface of the earth which can easily be measured. According to Dr Prout, 100 cubic inches of pure dry air, at 60° of temperature, and the barometer standing at 30 inches, weigh 31 grains. The weight on every square inch of surface at the level of the sea generally amounts to about 15 lb. avoirdupois, being the same as the weight of a column of water of equal base, 34 feet high, or of a column of mercury 30 inches high. Supposing the surface of a man's body to measure 15 square feet, it sustains a pressure of no less than 14 tons. Being a highly elastic fluid, the density and pressure of the atmosphere rapidly diminish as we ascend upward, 1000 feet of ascent (near the surface) roughly corresponding to a fall of 1 inch in the barometer; or, to speak more exactly, *As the elevation increases in arithmetical progression, the density and pressure decrease in geometrical progression.* Thus, at the level of the sea, the pressure on each square inch is 15 lb., or equal to a column of mercury 30 inches high; at 3.4 miles above the surface the pressure is only 7½ lb., or 15 inches of mercury; and at 6.8 miles of elevation, 3¾ lb., or 7½ inches of mercury. From this the application of the barometer in ascertaining the heights of mountains becomes obvious.

Height of the Atmosphere.—Many reasons combine to induce the belief that the atmosphere does not expand to an indefinite height, but terminates at an altitude of from 45 to 50 miles. Its height is also different in different latitudes, being considerably greater between the Tropics than within the Polar Circles. This is owing partly to the greater centrifugal force that exists in the equatorial than in the polar regions (caused by the rotation of the earth around its axis), and partly to the high temperature of the earth's surface in low latitudes, which causes the air in contact with it to expand at the rate of $\frac{1}{4}\frac{1}{3}\frac{1}{7}$ of its volume at 32° Fahr. ($= \frac{1}{2}\frac{1}{7}\frac{1}{3}$ Cent.) for every increase of 1°. Sir James Ross observed that, in South Victoria Land, lat. 78°, the

barometric pressure rarely exceeded 29 inches, whereas in the torrid zone it averages about 30 inches.

Temperature of the Atmosphere.—When ascending the side of a mountain-chain, the traveller feels the cold increasing perceptibly in proportion to his elevation; and should the chain be sufficiently lofty, he will find the summit covered with perennial snow. If the ascent is made within the tropics, this difference of temperature arising from elevation is beautifully represented to the eye by a corresponding succession of climatic zones, each of which is occupied by a fauna and flora peculiar to itself, but quite analogous to the succession of zones, with their respective faunas and floras, that is traversed when proceeding from the equator to either pole. This beautiful phenomenon, of which the Andes and Himalaya afford the most striking examples, depends on the fact that any change in the density of the atmosphere is uniformly accompanied by a corresponding change in its temperature. When a gaseous body expands, a portion of its heat becomes latent, and the amount of heat required to raise it to any given temperature increases the more the gas expands. If there be no source of heat from which this additional quantity can be obtained, the gas will cool during expansion, by a portion of its free heat becoming latent. Generally speaking, the thermometer sinks 1° of Fahr. for every 300 feet of elevation for the first mile above the surface, but the rate is influenced by many causes. For higher elevations no regular law has been ascertained.

Winds.—When the air is put in motion by any cause, a wind is produced; and no cause so powerfully contributes to such motion as local changes of temperature, arising from the unequal degree in which portions of the earth's surface are heated by the solar rays. In order to obtain a clear notion of the nature and direction of winds, it will be necessary to leave out of view, for the time, the various inequalities of the earth's surface, and to regard it as uniformly spherical. In tropical regions, where the sun is always vertical at noon, his rays fall perpendicularly on the surface, and consequently with a far greater heating power than if they came down slantingly, as in the temperate and frigid zones. The heated surface communicates its own temperature to the stratum of air in contact with it, causing the latter to expand, and, with a diminished density, to ascend through a higher stratum, supported by which it flows off towards the nearest cold region, its place meanwhile being supplied by other currents proceeding from adjacent cold regions. Hence we should expect that at any point on the surface in the northern hemisphere, northern winds (that is, winds *from* the north) would prevail throughout the year; while everywhere in the southern hemisphere they would blow incessantly from the south. And, were the earth at rest, and its surface wholly land or water, such would be the actual direction of the winds throughout the year. But the earth rotates on its axis from west to east every twenty-four hours, its equatorial parts moving at the rate of 1000 miles per hour, while at the poles the surface remains at rest. Hence, in passing from the higher latitudes towards the equator, the cold currents of

air arrive progressively at regions of increased rotatory velocity; and as they cannot keep pace with this increase of motion, they necessarily lag behind, and form currents flowing in a direction opposite to the rotation of the globe, or from *east* to *west;* and thus, by the combined effects of the rotation of the globe and the difference of temperature at its surface, the northern and southern currents are deflected and modified, so as to become respectively the permanent north-easterly and south-easterly currents, forming the magnificent phenomenon of the **Trade-Winds.** These winds extend, with occasional interruptions and modifications, from the vicinity of the equator to the 28th or 30th parallel, N. and S.—the limit varying according to the sun's northern or southern declination. Their action is most regular in the Atlantic and Pacific Oceans; but their influence is neutralised in the vicinity of continents and large islands by the currents that are generated on the land. In the Indian Ocean and south-eastern Asia, the trade-winds undergo remarkable modifications, changing their direction at certain seasons of the year, and hence called **Monsoons.** These winds prevail over a tract extending from lat. 7° S. to the Tropic of Cancer, and from the E. coast of Africa to Japan, Siberia, and the W. Pacific Ocean. They blow for six months of the year in one direction, and for the other six in an opposite one; the change occurring about the 15th April and the 15th October. On the north side of the equator the N.E. monsoon prevails, with little variation, from October to April; while from April to October it is replaced by the S.W. monsoon. In the W. part of the Indian Ocean south of the equator the N.W. monsoon blows from October to April, constituting the rainy season; while from April to October the S.E. monsoon holds sway, and forms the dry season. The last-named monsoon may be considered as identical with the S.E. trade-wind. In general, the monsoons blow towards the continent during summer, and in an opposite direction in winter. They regulate the alternations of the wet and dry seasons throughout south-eastern Asia—the rainy season of the W. coast of India corresponding with the prevalence of the S.W. monsoon, and that of the E. coast with the S.E. monsoon. They are also of great importance to commerce, for by them a ship may be wafted to a distant port, where she remains till the monsoon changes, and is then aided by it home again.

Zone of Calms and Variable Winds.—In the Atlantic and Pacific oceans, immediately under the equator, where the N.E. and S.E. trade-winds approach each other, there occurs a zone of calms and variable winds; there being a calm when the opposing winds wholly neutralise each other, and a wind, which is usually from the east, when either predominates. This zone varies in breadth from 150 to 500 miles, according to the season of the year, and is perpetually shifting its position. In March and April it extends from lat. 7° N. to 2° N.; in July and August from 7° N. to 12° N.; thus ranging over 10° of latitude. As each of the trade-winds has traversed a great extent of ocean before arriving at the equator, it becomes highly charged with vapour; and hence this zone is characterised by

constant precipitation, the rain falling at irregular intervals and at all hours of the day. The heat is great, and thunderstorms are frequent; and perhaps there is no part of the ocean more dreaded by mariners than the zone of calms and variables.

Region of S.W. and N.W. Winds.—We have seen that the heated air of the Torrid Zone, forced upwards by colder and denser currents, finds its way to the Frigid Zones. On quitting the tropics it begins to cool, and consequently to descend, arriving at the surface about the 30th parallel of latitude in both hemispheres. Were the earth stationary, and were there, also, no opposing current from the polar regions, it is obvious that south winds would prevail over the entire N. Temperate Zone, and north winds over the S. Temperate Zone. But the earth rotates from west to east, and the wind, on its way from the tropics to the poles, is ever arriving at zones of surface possessed of less rotatory velocity than itself; and it will, therefore, so far as this cause is concerned, manifest itself as a *west* wind. Combining, now, both these causes, the resultant effect is that in the N. Temperate Zone S.W. winds must prevail, while in the S. Temperate Zone N.W. winds will predominate. Both these winds, however, are subject to great irregularities, mainly owing to their being affected by the great polar currents that are ever proceeding from the poles to the equator. The winds which result from such collisions must necessarily take a *mean* direction, depending on the relative force of the opposing currents; but this direction, though very variable, is chiefly *westerly*. In the North Atlantic they are chiefly from the S.W.; and the effect is, that a sailing vessel which takes forty days from Liverpool to New York can make its return voyage in twenty-three days. South of the equator, between the parallels of 40° and 50° S., the winds are pretty regular, being generally W.N.W.; while in the N. Frigid Zone no regular succession has been observed, but northern winds are the most frequent.

Land and Sea Breezes.—On islands and near the shores of the continents, especially in warm and tropical regions, the wind during the day blows from the sea, while during the night it pursues a contrary direction. After the explanations given above, the cause of this becomes sufficiently obvious. The sea and the land are very unequally heated by the solar beams. About sunrise and sunset the temperature of both is nearly equal, and there is consequently no wind either way; but shortly after sunrise the land becomes warmer than the water, in consequence of the more powerful action of the solar rays; the temperature of the stratum of air next the surface is increased and its density lessened; it must therefore ascend to the upper regions of the atmosphere, leaving behind a vacuum, which is immediately occupied by colder and denser air from the ocean. Thus is originated a *sea-breeze*, which attains its greatest velocity at the period of the maximum heat of the day, and gradually declines towards evening. During night, when the temperature of the sea exceeds that of the land, the current of air must necessarily flow in an opposite direction, and produce what is called the *land-breeze*.

The Vapour of Water and its Products.—The quantity of vapour in the atmosphere, which is always very small, varies with the temperature, being greater when the temperature is high, and smaller when it is low. Sir John Leslie showed, by numerous experiments, that the air can hold the 160th part of its own weight of vapour in suspension when its temperature is at 32° Fahr.; the 80th part of its weight at the temperature of 59°; the 40th part at 86°; the 20th part at 113°; and the 10th part at 140°. Seas, rivers, lakes, and moist ground are the sources from which the vapour in the atmosphere emanates. When water is thus passing from the liquid into the gaseous or invisible form, it is said to *evaporate*. Evaporation takes place at all temperatures, and is caused chiefly by the action of winds and of the solar heat on the surface of the earth; and the more intense this action is, the greater becomes the quantity of moisture that rises into the atmosphere. When the air has received as much vapour as it is capable of holding in the invisible form, at any given temperature, it is said to be *saturated*. Should any more vapour enter it at this temperature, or should its temperature be reduced to any extent, the superabundant vapour instantly becomes visible, and assumes the form of mist or clouds, or is precipitated as dew, hoar-frost, rain, snow, or hail. Should the reduction of temperature take place at a considerable elevation above the surface of the earth, by means of a cold current of air coming into contact with a warmer one already at the point of saturation, **clouds** will be the form which the superabundant vapour will assume; but if the reduction takes place at a lower level, so that the cloud rests on the ground instead of floating in the upper regions of the atmosphere, it is called a **fog** or **mist**. Clouds and mist are identical in their nature, and only differ in respect to elevation; for in each of them the vapour, formerly invisible, is supposed to pass into the form of minute, visible globules, which, from being hollow within, are possessed of such buoyancy as to be capable of floating in the atmosphere. When the surface of the ground has been reduced by radiation, so that the air in contact with it falls below its point of saturation, a portion of the vapour contained in the latter becomes condensed, and assumes the form of **dew**; and when the radiation has proceeded so far as to reduce the surface below the freezing-point, **hoar-frost** is the product. The quantity of dew, however, which is deposited on any given object depends not only on its temperature, but in a great measure also on the nature of its materials, its texture, and the roughness or smoothness of its surface. Thus, while metals, stones, and wood, are found comparatively dry, living plants of every form are copiously laden with dew: substances having a close texture are unfavourable to its formation, while those that are loosely compacted, as cloth, wool, down, cotton, &c., are highly favourable; and those surfaces which part with their heat least readily, as, for example, polished metals, contract the least dew; while those that part with their heat most readily—viz., roughened or painted surfaces, contract the most. When the temperature that has led to the formation of the minute hollow vesicles of which a cloud consists has been reduced still lower, the vesicles become larger; then unite

in twos and threes; and ultimately, by reason of their density and increased gravity, fall to the ground in large drops of **rain**. When the vesicles have been exposed to an intensely cold current of air, they are congealed or solidified into minute, icy crystals; and when many of these collect together, they usually assume a highly symmetrical and beautiful shape before descending to the earth in the form of flakes of **snow**. Captain Scoresby, during his Arctic voyages, observed nearly a hundred different forms of snow-flakes, many of which were extremely beautiful. Should the snow-flakes, in descending towards the surface, pass through a warm stratum of air, they melt and become **rain-drops**; and, on the other hand, should the rain-drops, while descending, pass through a stratum of very cold air, they are converted into **hailstones**.

Distribution of Rain.—Rain falls very unequally in different regions of the globe, but in general the greatest quantity of rain falls in warm climates, as evaporation proceeds there more rapidly than in cold and temperate regions. The following generalisations, which can only be regarded as rough approximations, will be found useful:—

1. Rain is more abundant in tropical regions than under higher latitudes; but the number of rainy days is greater the farther the place is from the equator. The annual average of rain between the tropics is about 96 in., and the number of rainy days is only 80; while in the two temperate zones the average annual fall is only 37 inches, but the number of days on which rain falls varies from 54, in the N. of Syria, to 169 at St Petersburg. 2. The annual amount of rain decreases in ascending from low plains to elevated plateaux. 3. On the contrary, the amount of rain *increases* in ascending from plains to the rugged slopes of mountain-chains. Thus, while at Paris only 20 inches of rain fall annually, upwards of thrice that quantity falls on the sides of the Great St Bernard; and in England the quantity that falls in the mountainous districts is more than double that of the less elevated portions of the country. 4. The amount of rain decreases as we proceed from the shores of continents towards their interior; thus, while on the W. coast of Ireland, Norway, and Portugal, the annual average is 47, 80, and 111 inches, respectively, in central and eastern Europe it is only 15 inches. There are important exceptions, however, to this rule, arising from the direction and position of mountain-chains, and from the character of the winds (whether dry or humid) to which any given place is exposed. For example, one side of a mountain-chain may be humid, while the other is comparatively rainless. The Andes in South America, the mountains of Norway, and Mount Atlas in North Africa, afford striking examples. 5. Within the tropics, the *eastern coasts* of the continents, owing to their exposure to the trade-winds, are more humid than the western; while in the temperate zone their *western sides*, from being exposed to westerly winds charged with moisture—received in their passage across the Atlantic and Pacific Oceans—are more humid than the eastern.

5. CLIMATE.—By the climate of a place is meant the prevailing character of its weather, or all those states and changes of its atmosphere which sensibly affect the organs of plants and animals. The peculiarities of climate are mainly attributable to the following causes:—

1. **Latitude.**—This determines the amount of solar heat which the

place enjoys—which amount depends, not merely on the length of time it is continuously exposed to the solar rays, but especially on the direction of the rays when the sun is in the meridian. Between the tropics the solar rays descend vertically at noon, and hence produce their maximum effect; but the more remote the place is from the torrid zone, the rays descend more and more slantingly. 2. **Elevation.**—The more elevated any place is, the lower is its temperature; and a change of level of only a few feet will diminish the temperature of the place as much as a change of latitude amounting to many miles. In the torrid zone an ascent of 300 feet sinks the thermometer 1° Fahr.; but the rate is not uniform as the ascent is continued—less than 300 feet being sufficient for reducing the temperature another degree. A smaller elevation will also suffice for producing this effect in higher latitudes. By continuing the ascent in any latitude, we at length arrive at what is called the **snow-line**, or the **limit of perennial congelation**. This line attains its maximum elevation between the tropics, and gradually descends—though at a rate not yet exactly ascertained—as it proceeds to the poles. In the Antarctic regions it reaches the sea-level between the 67th and 71st parallel; but in the north frigid zone it is more than doubtful whether it touches the sea at all: for here the greater dryness of the climate and the perpetual day of summer occasion the complete disappearance of the snow, though the mean annual temperature is as low as zero (Fahr.) The height of the snow-line is not regulated exclusively by the degree of latitude; but depends very much on the exposure of the place, the character of the prevailing winds, and on the depth of the snow that has fallen during winter. None of the mountains of the British Isles attain the height of the snow-line; but Ben Nevis, the highest of them, whose height is 4406 feet, approaches it very closely, as it generally retains the snow in the deeper ravines all the year round. 3. **Slope** or **Aspect** at noon greatly affects the climate of a country, especially in the temperate zone. If the slope is towards the sun at noon, the rays of that luminary fall more directly on the surface, and therefore produce a greater effect than if the place is level; while, on the other hand, if the surface inclines towards the north, the contrary effect is produced. Thus, in Siberia and British America, where the slope is northward, as indicated by the direction of the rivers, the climate is incomparably more rigorous than in the British Isles and Scandinavia, though situated between the same parallels of latitude. In the south of Siberia mercury freezes in winter; whereas in Ireland the myrtle grows in the open air. Even in the same locality the greatest diversity of climate prevails on the opposite sides of a mountain-range. Thus, on the southern slopes of the Alps of the Valais, the vine attains to its utmost perfection, while the northern slope is densely covered with ice and snow. 4. **The Situation of a Country in respect to Large Tracts of Land or Water.**—The temperature of the ocean is more equable than that of the land, being less affected by the action of the solar rays and by radiation. Hence, through the agency of the winds, those countries which are situated near the ocean are less subject to the extremes

of heat and cold than other countries under the same latitude, situated in the interior of continents. Thus London enjoys a milder winter and a cooler summer than Paris, which is 2° 42′ of latitude farther south. In the northern hemisphere a country is rendered hotter by having a large tract of land to the south and sea to the north, but cooler when these relations are reversed. 5. Other important elements of climate, such as the **prevalence of particular winds**, proximity to **ocean-currents**, the **annual fall of rain**, and the **direction and relative position of mountain-chains**, together with the **nature of the soil** and the **degree of cultivation** to which it has been subjected, have for the most part been treated of in previous sections of this work, and need not here be resumed.

Isothermal Lines and Climatic Zones.—As the temperature of any given place depends on a multitude of causes besides latitude, it is obvious that the old designations of *torrid, temperate,* and *frigid zones,* bounded by the tropics and the polar circles, do not adequately express the temperature, and far less the general climatic character, of the different parts of the earth's surface. Humboldt and others have accordingly substituted other lines, instead of the parallels, as the true boundaries of climatic zones—viz., *Isothermal, Isocheimenal,* and *Isotheral lines.* The mean annual temperature of any given place may be readily ascertained by means of the thermometer; and imaginary lines connecting together all the places in the same hemisphere, having the same *mean annual temperature,* are called Isotherms. The Isocheimenals are similar lines connecting places that have the *same winter temperature,* and the Isotheral lines are those drawn between places having the *same summer temperature.* These lines of equal temperature approximate, more or less, to the direction of the equator, though they are nowhere parallel to it. They diverge from it more in the northern than in the southern hemisphere, and greatly more in high than in low latitudes. The hottest portion of the earth's surface is an oval-shaped tract in East Africa, extending from Lake Tchad to Mecca and the Strait of Babelmandeb, having a mean annual temperature of 81°; and the *coldest,* so far as yet ascertained, is a long narrow belt in the Arctic Ocean, midway between Behring Strait and the North Pole, and extending from Melville Island, in the direction of New Siberia, with an average temperature of 0° Fahr. It appears, therefore, that the hottest region is not under the equator, nor the coldest under the pole; and that all the lines of equal temperature in the northern hemisphere attain their highest latitude in the eastern side of the Atlantic Ocean—owing, no doubt, to the high temperature of the Gulf Stream, which flows northward along the western shores of Europe. By means of these Isotherms each hemisphere is divided by the meteorologist into six climatic zones, named respectively the *hot* or equatorial, the *warm, mild, cool, cold,* and *frigid* or polar zone.

The **Equatorial Zone** extends on both sides of the equator, is bounded by the isotherms of 77°, and embraces Central America, the West India Islands, a portion of South America, all Africa between the Atlas chain and the 15th degree of S. latitude, and the north of Australia. The

Warm Zone is bounded on the south by the equatorial zone, and on the north by the isotherm of 59°, which, in the New World, passes through San Francisco and Cape Hatteras; and, in the Old World, through the north of Spain, Rome, Gallipoli, the north of Asia Minor, the south of the Caspian, Lake Koko-Nor, the mouth of the Hoang-Ho, and the capital of Japan. The **Mild Zone** is bounded on the south by the warm zone, and on the north by the isotherm of 41°, which passes through the Aleutian Islands, Sitka, a little south of Lake Superior, through the centre of Nova Scotia; and, in the Old World, through Bergen, Christiania, Stockholm, Riga, Moscow, and Orenburg. The **Cool Zone** is bounded on the north by the isotherm of 32°; which, in the New World, passes Cape Romanzoff, Cumberland House, and the southern extremity of James Bay, south of Nain in Labrador, and north of Cape Farewell in Greenland; and, in the Old World, through the north of Iceland, Hammerfest, head of the Gulf of Bothnia, Archangel, Tobolsk, and to the south of Lake Baikal. The **Cold Zone** is bounded on the north by the isotherm of 5°, which passes through the centre of the North American Archipelago, north of Greenland, and through the extreme north of Siberia. And, lastly, the **Polar Zone**, whose southern limit is the isotherm of 5°, embraces all the remainder of the Arctic regions.

Table of Mean Temperatures.—In order to illustrate this subject more fully, we subjoin a table of the mean *annual*, mean *winter*, and mean *summer* temperature of a number of the most important cities in the world.

Cities.	Lat.	Mean annual temp.	Mean— Dec. Jan. Feb.	Mean— June, July, Aug.
London, ...	51° 32′N.	50°.1	37°.3	63°.8
Edinburgh, . . .	55° 57′	47.2	37.9	57.6
Dublin, ...	53° 21′	50.1	41.9	59.8
Paris, ...	48° 50′	51.5	38.2	64.9
Marseilles, . . .	43° 17′	57.	45.	72.0
Lisbon, ...	38° 41′	61.4	52.5	70.94
Madrid, ...	40° 25′	57.9	42.	74.5
Gibraltar, . . .	36° 8′	64.5	55.3	73.8
Rome, ...	41° 54′	59.5	45.2	74.2
Constantinople, . .	41°	56.3	40.	72.
Brussels, ...	50° 52′	50.4	37.4	64.
Vienna, ...	48° 13′	50.	31.5	68.
Berlin, ...	52° 31′	48.3	33.6	64.2
Copenhagen, . . .	55° 40′	46.56	31.31	62.7
Stockholm, . . .	59° 17′	42.27	26.04	60.43
St Petersburg, . .	59° 58′	38.7	17.2	60.8
Moscow, ...	53° 42′	39.6	14.7	64.9
Yakutsk, ...	61° 58′	13.9	36.7	58.7
Pekin, ...	39° 53′	54.8	26.7	81.1
Canton, ...	23° 12′	70.4	53.3	84.
Singapore, . . .	1° 15′	80.8	79.4	91.4
Calcutta, ...	22° 36′	90.	72.25	86.72

Cities.	Lat.	Mean annual temp.	Mean— Dec. Jan. Feb.	Mean— June, July, Aug.
Madras, ...	13° 5′	82°.9	77°.2	86°.7
Bombay, ...	18° 57′	81.27	77.44	82.84
Cabool, ...	34° 53′	68.	41.	83.
Jerusalem, . . .	31° 47′	63.4	48.6	74.7
Cairo, ...	30° 3′	72.2	58.52	85.1
Tunis, ...	36° 46′	68.7	55.76	83.
Sierra Leone, . .	8° 28′	79.	79.	77.
Timbuctoo, . . .	17° 48′	79.	68.	83.
Melville I., . . .	75° 40′	1.24	—28.45	37.08
Nain, ...	56° 25′	27.82	3.66	47.9
Montreal, ...	45° 31′	45.8	17.8	71.4
Halifax, ...	44° 38′	42.9	23.6	62.3
New York, . . .	41° 6′	51.7	31.4	72.3
New Orleans, . .	30°	69.8	55.8	82.04
Mexico, ...	19° 25′	60.6	53.64	65.23
Havannah, . . .	23° 10′	77.9	82.4	73.
Mozambique, . .	15° 2′ S	78.	79.	73.
Cape Town, . . .	34° 56′	64.7	70.	58.3
Quito, ...	0° 13′	73.31	77.6	59.71
Rio de Janeiro, . .	22° 57′	74.1	78.2	69.2
Melbourne, . . .	37° 49′	57.6	65.2	49.
Sydney, ...	33° 54′	62.7	69.6	54.
Auckland, . . .	36° 52′	60.3	68.7	53.3

6. MINERALOGY.—The sixty-five constituent elements forming the earth's crust are, in general, characterised by a strong affinity for each other, disposing them to form compound bodies, each of which possesses properties widely different from those of its constituents. These compounds are termed *minerals*, and the science which treats of their forms, composition, and other properties, is called Mineralogy.

Number of Minerals.—The number of mineral species at present recognised by science somewhat exceeds five hundred, many of them having, in addition, a great number of varieties. The mineral species, however, found on our globe, is exceedingly small when compared with the vast number of species in the animal and vegetable kingdoms. All the species above named have been arranged by mineralogists into seven orders and thirty-seven families. These orders, with their respective families, are as follows:—*Oxidised Stones*, comprising 12 families—quartz, felspar, scapolite, haloid stones, leucite, zeolites, mica, hornblende, clays, garnet, gems, and metallic stones. 2. *Saline Stones*, 5 families—calc-spar, fluor-spar, heavy-spar, gypsum, rock-salt. 3. *Saline Ores*, 3 families—sparry iron ores, copper salts, lead salts. 4. *Oxidised Stones*, 5 families—iron ores, tin-stone, manganese ores, red copper ores, white antimony ores. 5. *Native Metals*, forming only one family. 6. *Sulphuretted*

Metals, 6 families—iron pyrites, galena, grey antimony ore, grey copper ore, blende, ruby blende. 7. *Inflammables*, 5 families—sulphur, diamond, coal, mineral resins, inflammable salts.

Forms of Minerals.—Mineral substances occur in nature in two distinct modes of aggregation—amorphous and crystallised. When the particles of the mineral are merely collected together, without exhibiting any regularity of structure, it is called *amorphous;* but should the mineral possess a definite chemical composition, together with a regular symmetrical external form, it is said to be *crystallised.* Generally speaking, every mineral substance, whether simple or compound, is found in nature with a form peculiar to itself, and that readily distinguishes it from all other minerals. Many of them, moreover, exist in various allied forms, and hence the number of natural crystals is enormous. Mineralogists, however, have succeeded in arranging them all under *six systems* of crystallisation, to each of which belongs a number of forms having some properties in common. In every crystal there are found three axes, which intersect at its centre and pass through from side to side. The entire classification of crystals depends on the relative lengths and position of these axes. 1. The first system is named the *Regular* or *Tesseral System* (from *tessera*, a cube), and is characterised by three equal axes intersecting each other at right angles. It includes the cube, the regular octohedron, the rhombic dodecahedron, and the regular tetrahedron. Some of the best-known minerals that assume one or other of these forms are common salt, alum, fluor-spar, iron pyrites, grey copper ore, and boracite. 2. The *Quadratic* or *Tetragonal System*, with three axes at right angles, but one shorter or longer than the other two. Eight principal forms, with numerous varieties, belong to this system, among which are included the first and second right square prisms, and the first and second right square octohedra; examples—zircon, stannic oxide, and yellow prussiate of potash. 3. The *Hexagonal* or *Rhombohedral System*, with four axes, three of which are equal, intersecting each other in one plane at 60°, and one principal axis at right angles to them. It embraces the regular six-sided prism, the regular six-sided pyramid, and the rhombohedron. Rock-crystal, calc-spar, beryl, corundum, graphite, and many other minerals, assume forms belonging to this system. 4. The *Rhombic System*, characterised by three axes, all unequal, but at right angles to each other: its principal forms are the right octohedron with rhombic base, and the right rhombic prism. This system comprises only a few varieties of form essentially distinct, but embraces nitre, native sulphur, topaz, and arragonite. 5. The *Monoclinic* or *Monoclinohedric System*, having three unequal axes, two of which intersect each other at an oblique angle, and are cut by the third at right angles. The forms peculiar to this system—among which is the oblique rhombic octohedron—approach very near to those of the rhombic, but the inclination of the axes enables us readily to distinguish them. As examples of the numerous minerals assuming one or other of its forms may be mentioned sulphur deposited from fusion, sodium carbonate, and borax. 6. The *Triclinic* or *Triclino-*

hedric, with three axes, all unequal and all oblique. This is the least regular of all the systems, and departs the most widely from symmetry of form. The doubly-oblique octohedron and the doubly-oblique prism are the leading forms; examples—copper sulphate, boracic acid, and albite.

7. GEOLOGY.—Minerals aggregated together, so as to form large masses, are technically called *rocks*. These rocks, according to their structure, are of two kinds: either they consist of minute particles of one and the same mineral, or of two, three, or more different minerals aggregated together. The former are called *simple*, the latter *mixed rocks*. Thus, for instance, *marble*, consisting of nothing but grains of carbonate of lime, is a simple rock; while *granite*, on the contrary, which is made up of small crystals of quartz, felspar, and mica, is a mixed rock. The component parts of a rock are either crystallised together, or united by a non-crystalline cement, in the same manner as mortar binds the stones of a wall. In many rocks the cohesion is very great, as for instance in greenstone; while in others it is but slight, as in sandstone, gravel, coal, &c. As compared with the vast variety of minerals, the number of distinct rocks is exceedingly small. They are also pretty uniformly distributed over the globe, while none of them is peculiar to any particular country. Thus, while the plants and animals of tropical regions differ exceedingly from those of the frigid zone, the materials which form the mountain-ranges, as well as the pebbles along the sea-shore, are everywhere the same. Notwithstanding, however, this general uniformity, there is considerable local variety, depending on the geological character of the place. Thus a traveller setting out from London, either to Berwick or Land's End, will find the character of the rocks continually varying as he proceeds from county to county; and before he arrives at his destination, he will have passed in review almost every variety of rock in the geological scale. In like manner, when a considerable *section* of the earth's crust is exposed to view—as in sea-cliffs, quarries, mines, and railway cuttings—a great variety of rocks is discernible; but they may be all reduced to two principal kinds. They are either arranged in beds or layers, and hence known as *stratified rocks;* or they are found in shapeless, indeterminate masses, destitute of any such arrangement, and therefore called *unstratified*.

Unstratified Rocks.—The unstratified rocks are also termed *igneous*, being regarded as having been formed by the agency of fire, at a time when the temperature of the earth's crust was immeasurably higher than at present. Most geologists are of opinion that our planet was in an incandescent state in the earlier stages of its exist-

ence, just as the sun and fixed stars are by some supposed to be at the present day. In the course of ages, according to this hypothesis, the exterior portion gradually cooled down, and the materials of which it consisted, previously in a molten state, came by degrees to assume the consolidated form which the crust of the earth now presents, while the interior still retains its former intense heat. Whatever view we may form of this hypothesis, there can be no doubt of the fact, that the lower we penetrate into the bowels of the earth the temperature gradually increases. A thermometer placed in any locality, only 3 feet below the surface of the earth, no longer indicates the changes of the daily temperature, but merely those of the year. Again, at a depth of 55 feet, it indicates everywhere and at all times the same temperature, which is neither affected by the hottest summer nor by the coldest winter. Below this depth, it has been found that a rise of 1 degree of Fahr. takes place for every 50 or 55 feet of descent.* Calculating at this rate of increase, a temperature of 2400° Fahr. would be reached at a depth of 25 miles, sufficient to keep in fusion such rocks as basalt, greenstone, and porphyry; at a depth of 36 miles the temperature would be 3272°, sufficient to melt iron; and at a depth of 54 miles, a heat of 4892° would prevail—a temperature at which all known substances would pass into the liquid or molten form. The phenomena of hot springs, volcanoes, and earthquakes, afford other and independent evidence of the intense heat prevailing in the interior of our planet. The igneous rocks have everywhere the appearance of having existed at a former period in a molten state; and the numerous varieties of beautiful crystals found associated with them are a striking testimony of their having cooled down with great slowness and regularity. Generally speaking, they occupy a lower position in the crust than the aqueous; though they are often seen overlying the latter, or separating the strata of which they consist, or forcing their way through those strata in veins, rents, and fissures. They are usually divided into three principal kinds—*granitic*, *trappean*, and *volcanic*. The first of these is reckoned the oldest, as it is generally found underlying or associated with the oldest series of the stratified rocks; the second is considered more recent in its origin, because occurring for the most part among the secondary and tertiary formations; and the third, as the newest of all, being generally found associated with those modern formations which have been deposited since the ter-

* "It follows from this important result that heat must be constantly passing from the interior of the earth to its surface, whence it escapes into space; and hence the temperature of the whole earth must be cooling from year to year. Sir W. Thomson of Glasgow has calculated that during the last 96,000,000 years, the rate of increase of temperature under ground has diminished from 1° for every 10 feet, to 1° for every 50 feet, of descent, as at present; and adds, that if this action had been going on with any approach to uniformity for 20,000,000,000 years, the amount of heat lost out of the earth would be more than enough to melt a mass of surface-rock equal in bulk to the whole earth, and in 200,000,000 years it would be enough to melt the rocks forming the earth's crust. If this reasoning be just, geologists cannot claim a much higher antiquity for life on the globe than 100,000,000 years."—Buchan's Meteorology, 2d edit., p. 118.

tiary era. The following are the principal rocks belonging to these three varieties, beginning with the lowest :—

GRANITIC: Common granite (consisting of small regular crystals of quartz, felspar, and mica), porphyry or porphyritic granite, syenite, protogine, pegmatite, hornblende rock, primitive greenstone, serpentine, felspathic rock, &c.

TRAPPEAN: Basalt, greenstone or dolerite, clinkstone, compact felspar, hornstone, pitchstone, claystone, amygdaloid, trap-tuff, &c.

VOLCANIC: Lava, trachyte, obsidian, pumice, pearlstone, tufa, scoriæ, palagonite, sulphur, &c.

Igneous rocks are very widely distributed, and play a most important part in the physical aspect of many countries. The mightiest mountain-ranges on the earth's surface are mainly formed of the granitic series, as the Alps, Pyrenees, Ural, and Grampian Mountains in Europe; the Himalayas in Asia; the Abyssinian Mountains in Africa; and the Andes in South America. The prevailing scenery is dreary and monotonous, and the soil barren and inhospitable. But the economic uses of granitic rocks are numerous and varied. They form exceedingly durable building-stones, admirably fitted for bridges, lighthouses, docks, fortresses, and as road and street materials. When polished they are generally highly ornamental, and are therefore employed for obelisks, tombstones, and pillars. The industrial products of the trap-rocks are also numerous, though not of equal importance. Some basalts and greenstones make good building-stone, but the difficulty of dressing them into the required shape prevents their extensive use. Nearly all the sulphur of commerce is derived from volcanic regions; pumice has long been used as a polishing or rubbing stone; while many of the lavas yield precious stones, and others are metalliferous.

STRATIFIED ROCKS.—These are divided by geologists into two great series—the Crystalline or Non-fossiliferous, and the Fossiliferous. The former,—also called Metamorphic rocks,—are usually found immediately above the granitic, separating them from the fossiliferous strata above, and embrace the following members—viz., gneiss, mica-slate, clay-slate, hornblende-slate, talc-slate, actynolite-slate, chlorite-slate, quartz-rock, and primary limestone. Although gneiss usually occupies the lowest place in the series, these rocks do not follow any invariable order, and not unfrequently one or more of them is wanting. The materials of these strata appear to have been originally deposited by water in the form of sediment, and to have been subsequently so altered by subterranean heat as to assume their present crystalline texture. At the time of their original formation they were probably replete with organic remains similar to the fossiliferous systems above them; but the intense heat pro-

ceeding from the underlying granite has destroyed every vestige of organic matter. In regions where the Metamorphic rocks lie near the surface, the scenery is usually bold, rugged, and picturesque, and the soil unproductive; but slate, marble, and building-stone are obtained in them, and not unfrequently tin, copper, lead, silver, and gold.

Fossiliferous Strata — **Palæontology.** — By carefully studying the fossiliferous strata above mentioned, we obtain most important information regarding the earliest stages of the earth's existence—information, in fact, nowhere else to be found. We learn, for example, that our world had arrived at a hoary antiquity before the creation of man; that it was not then a barren, untenanted wilderness, but the happy home of innumerable races of living creatures, which, once and again, were swept away by great natural catastrophes, and replaced by other orders of plants and animals, higher in the scale of being than their predecessors, and more nearly approximating in beauty of form and utility to the many races, animal and vegetable, which are now placed under man's domain. This knowledge is partly derived from the lithological character and immense depth of these strata, each of which, in its turn, must have been slowly deposited by the waters of seas, lakes, or rivers; but principally from the countless petrified remains of the animals and plants that had their abode in the waters or on the land, at the period of their formation. The branch of geology which treats of these organic remains is termed Palæontology (from *palaios*, ancient, *onta*, beings, and *logos*, a description), signifying a description of ancient beings. The long-continued study of the fossiliferous strata of many countries has enabled geologists to arrange the entire series into ten distinct and well-defined *systems*, each of which differs essentially from all the others, both as regards its lithological constituents and its petrified organisms. These ten systems are further grouped into three great *series*, or *periods*—viz., the Palæozoic, or most ancient; the Mesozoic, or secondary; and the Cainozoic, or most recent. The diagram (p. 51) indicates at a glance the precise place in the geological scale where each higher order of organised existence made its first appearance.

1. **The Laurentian System.**—This, the most ancient of all known fossiliferous deposits, derives its name from the river St Lawrence, in the basin of which it occupies an immense area. Sir W. Logan, of the Canadian Geological Survey, regards these rocks as the most ancient on the American continent, and as the equivalents of the oldest gneiss of Scotland and Scandinavia. In the geological scale they occupy a lower position than the Cambrian rocks of North Wales, and consist of highly crystalline gneissoid and horn-

blendic schists, which, in some localities, attain a thickness of 30,000 feet. Principal Dawson, the eminent Canadian geologist, has recently (1868) detected in the lower formation of these rocks what may justly be regarded as the earliest indication of animal life on our globe. This consists of a foraminifer, named by him *Eozoön Canadense*, a humble ZOOPHYTE, and one of the very lowest types of the animal kingdom. This zoophyte has since been detected in Bohemia, in strata underlying the Silurian rocks.

2. The Cambrian System.—(From *Cambria*, the ancient name of Wales), a term employed by Professor Sedgwick to designate the lowest fossiliferous rocks in North Wales. They consist mainly of slaty, gritty, and silicious beds of immense thickness (from 20,000 to 30,000 feet), which are regarded as the geological equivalents of the fossiliferous schists of Wicklow, the lower greywacke of Dumfries, the Northern Highlands of Scotland, the alum-schists of Sweden, and the Huronian sandstone of America. A deeper interest attaches to the Cambrian and Laurentian systems than to any other in the geological scale, on account of their containing the petrified remains of the earliest living inhabitants of our planet. These consist of FUCOIDS, a humble genus of marine plants; of Zoophytes (Oldhamia), and Graptolites, the lowest forms of animal life; of brachyopodous MOLLUSCS (lingula and terebratula); and of Trilobites (olenus and paradoxides), a remarkable family of CRUSTACEANS peculiar to the Palæozoic period.

3. The Silurian System, so called on account of its huge development in South-Eastern Wales, a locality once inhabited by the *Silures*, an ancient British tribe. Here it amounts to about 8000 feet in thickness, forming several distinct formations, which differ essentially in the character of their organic remains. The prodigious development of fossils has no parallel in the underlying formations. In the British Isles alone, in 1867, the Silurian strata contained 1194 recognised species, only 8 of which were plants. In a small tract around Prague in Bohemia, the indefatigable M. Barrande enumerates no fewer than 2735 species; while Dr Bigsby, in his 'Thesaurus Siluricus,' a work of immense industry and research, enumerates 7553 well-defined species as belonging to all countries. By inspecting this great work it will be perceived that in the Silurian age of the world's history all the classes of the invertebrate division of the animal kingdom are well represented, but that Molluscs, Echinodermata, and especially Trilobites, existed in vast numbers. But what imparts the deepest interest to the Silurian system is that it affords the earliest evidence both of vertebrated animals and of land-plants. These occur in the uppermost strata of the Ludlow rocks, and immediately underlying the lowest beds of the Devonian system. The vertebrata consist of FISHES of the genus *Pteraspis*. They are few in number (11 species only having yet been found in British rocks), small in size, and of the lowest order. They are all cartilaginous fishes, like the skate and dog-fish—for fishes with ossified vertebræ are not found till we arrive at the Devonian strata. The land-plants are also of the humblest rank, belonging to the family

Lycopodiaceæ, and allied to our present club-mosses. Very recently fishes have also been detected in the Lower Silurian formation. Silurian strata are extensively developed in many countries, especially in Wales, the South of Scotland, Bohemia, Russia, Scandinavia, North and South America, and Australia. The veins that traverse the system are usually metalliferous, yielding mercury, copper, lead, silver, and gold. It is mainly from rocks belonging to this system that the prodigious quantities of gold recently brought to light in Australia, California, the Ural Mountains, and other localities, have been obtained. They also yield flagstones, roofing-slates, and limestone for mortar and manure. In Silurian districts, the scenery is usually varied and picturesque, less abrupt and bold than in Metamorphic regions, yet more diversified by hill and dale than Secondary strata; but in Russia, south of the G. of Finland, they form wide level plains, or low plateaux. Sir Roderick Impey Murchison, the Prince of British geologists, has been the chief investigator of the Silurian system.

4. The Devonian or Old Red Sandstone System overlies the Silurian, separating it from the Carboniferous system. Geologists are far from being at one as to the number of formations into which it is divisible; but Hugh Miller, its most illustrious explorer, divides it into three—Lower, Middle, and Upper. It is largely developed in Scotland, South Wales, Devonshire, Belgium, Russia, and North America, where it usually consists of a succession of sandstones, alternating with layers of sandy shale and beds of concretionary limestones. The flora of the system consists partly of marine, but chiefly of land plants, of a greatly higher order than those found in the uppermost beds of the Silurian. Upwards of ten years ago, the author of this Manual discovered several huge calamites in the lowermost strata of the Old Red Sandstone of Aberdeenshire, previously regarded as unfossiliferous. Cone-bearing trees—plants as high in the scale of nature as the pines and cedars of the present day—were found by Miller, long previously, in the same formation at Cromarty; while Dr Dawson has recently discovered no fewer than eighty-two species of land-plants in the Devonian strata of Nova Scotia. To such an extent, indeed, did land-plants abound in the Devonian age, that in some localities, as at Point Gaspè, in Canada, thin seams of bituminous coal have been discovered. Perhaps the most beautiful species of the Devonian flora was the *Adiantites Hibernicus*, a tree-fern, obtained from the yellow sandstone series of Ireland and Roxburghshire. The fauna of the system displays an equal development; for though the Trilobites, which so pre-eminently characterised the Silurian system, have passed their meridian, other crustaceans of a still higher order appear in their room. The most remarkable of these is the *Pterygotus Anglicus*, a gigantic lobster-like crustacean, from 4 to 6 feet long, found in the Devonian rocks of Hereford, Forfar, and Ulbster in Caithness. A few *placoid* fishes were found in the Silurian system, but here fishes exist in vast numbers and of two distinct orders—Placoids and GANOIDS—the latter with osseous vertebræ and dermal skeletons. Among the most characteristic forms are *Onchus*, *Cephalaspis*, *Coccosteus*, *Asterolepis*, *Dipterus*, and *Holop-*

tychius. INSECTS make their first appearance here, but the reptilian remains of Elgin, formerly supposed to belong to this system, are now assigned to the Trias. In 1856, the total number of fossil species belonging to British Devonian rocks amounted to only 300; but the number has since been greatly increased. In the Rhenish and Belgian rocks alone, 450 species have been discovered; while the total number of species known in 1867 was 532. The minerals of the system are mainly building-stone of inferior colour and durability, paving-slabs of excellent quality, which are extensively exported from Caithness and Forfarshire; while to the trap-rocks of the system the lapidary is indebted for his agates, jaspers, and Scotch pebbles. The scenery is generally flat and tame, though occasionally highly diversified; and the soil, owing to its porousness, is usually well adapted for agriculture.

5. **The Carboniferous System**, so called from the profusion of vegetable matter (*carbon*) which it contains, consists in like manner of three formations — the Lower Coal-Measures or Carboniferous Slates, the Mountain Limestone, and the Upper or true Coal-Measures. Not unfrequently one of the members is wanting, and sometimes beds of one formation alternate with those of another. In some parts of Scotland the Lower Coal-Measures yield great quantities of serviceable coal; while in Ireland, where the formation is so enormously developed, little coal is found. Wherever this formation exists, it presents indications of having been deposited in fresh water, in estuaries, or in inland seas. The Mountain Limestone, again, is essentially a marine deposit, and, by the peculiar character of its fossils, forms the most easily recognised formation in the earth's crust. The Upper Coal-Measures, like the Lower, are mainly of lacustrine origin, and consist of alternations of sandstone, coal, shale, ironstone, clay, and impure limestone. The minerals of this formation, especially its coal and iron, form an inexhaustible source of wealth to those countries where, as in Britain, they most extensively prevail. In Britain, especially, they mightily contribute to our power and eminence amongst neighbouring nations. The flora of the system is the most abundant and gigantic that ever appeared on the earth's surface—consisting of coniferous trees of immense size, huge palms, tree-ferns, lepidodendra, calamites, sigillariæ, equiseta, club-mosses, and other allied forms. Wherever any of the Carboniferous formations occurs, these crowd every bed of shale, and form the materials of which every seam of coal consists. Considering, then, that the Coal-Measures exist in numerous lands and in all latitudes, and that these plants all belong to a tropical vegetation, the obvious inference is, that during the deposition of the Carboniferous strata a hot moist climate prevailed over the entire surface of the globe. The fauna is less peculiar than the flora, but it equally marks distinct progress in organic development. Here sauroid fishes, and REPTILES of the Batrachian or lowest order, appear for the first time.* The number of plants hitherto discovered in the whole sys-

* While these sheets are passing through the press, there is a report in the newspapers that Mr T. P. Barcas of Newcastle has detected, in the Northumber-

tem amounts fully to 1700, of which about one-tenth are phanerogamous. In British strata alone, the fauna, in 1867, numbered 1100 species. Carboniferous strata cover large portions of the British Isles. In England they extend from Derby to Berwick, but the Upper Coal-Measures are chiefly confined to South Wales and the valley of the Tyne. In Scotland they form a broad belt across the country from the coast of Ayrshire to Fife. Ireland is not rich in coal, all her coal-fields being situated in the Carboniferous limestone, which covers the central plain. On the Continent the principal localities are the north of France, Belgium, Germany, Prussia, Austria, and the south of Russia. In extra-European countries (for which see under the different continents) the main localities are, Hindostan, the coasts of Chili and Peru, the Isthmus of Panamá, Nova Scotia, and especially the United States of America, where the Coal-Measures occupy an area of 600,000 square miles. The economic importance of the Carboniferous system cannot be overrated. It furnishes nearly all the coal consumed in every civilised country. In the British Isles alone about 100,000,000 tons of this valuable mineral is dug annually. Almost equally important is the iron, which is usually associated with the coal. Other products of the system are, petroleum, asphalt, naphtha, paraffine-oil copperas, ochre, alum; the ores of lead, zinc, and antimony; marble, limestone, and building-stone of the finest quality. The scenery, with the exception of some limestone districts, is generally tame and unpicturesque, while the soil is often cold and only moderately fertile.

6. **The Permian System**, so named from its enormous development in the government of Perm, in Russia, forms the uppermost member of the great Palæozoic series of rocks. It was formerly known as the Saliferous or New Red Sandstone, in opposition to the Devonian or Old Red, from which it is separated by the Carboniferous system. It consists of two formations in England—Red Sandstone and Magnesian Limestone—but of three in Central Russia. The organic remains are neither numerous nor very remarkable, but approximate far more closely to those of the Carboniferous system below, than to those of the overlying Triassic. The flora, consisting of land and marine plants, amounts to 183 species, embracing fucoids, calamites, coniferous trees, and silicified trunks of tree-ferns. The fauna amounts to 350 fossil species, including 53 fishes. The Trilobites and other higher forms of crustacean life have disappeared. In common with the other Palæozoic systems, the fishes are all characterised by *heterocercal* or unequally-lobed tails; whereas in all the systems above the Permian the *homocercal* or equally-lobed tail predominates—a form which is nearly universal in the 8000 species now existing. Reptiles are more numerous than in the Carboniferous system, and now embrace SAURIANS as well as Batrachians—*e.g.*, the *palæosaurus*, *protorosaurus*, and *thecodontosaurus*, all of which are true air-breathing and land-inhabiting reptiles. The minerals

land Coal-Measures, the jaw of a true mammal! The effect of this discovery, if confirmed, will be to carry back the mammalian life of the globe for countless ages.

embrace excellent building-stones, limestone, gypsum, lithographic stone, and copper, and occasionally veins of galena and sulphuret of zinc. Permian strata are known to prevail in the north and midland counties of England, in the whole of eastern Russia, and over considerable areas in Ireland, France, Germany, and America. The physical aspect of Permian districts is by no means destitute of beauty and variety, though the scenery is sometimes tame and uninviting, and the soil well adapted for pasture and woodland.

7. **The Triassic System** derives its name from the fact that in Germany, where the system is highly developed, it consists of *three* well-defined formations—the *Bunter Sandstein*, the *Muschelkalk*, and the *Keuper*—the middle formation being wanting in England. With these formations we commence, on our upward march, the second great division of the fossiliferous strata, and hence named the MESOZOIC. At the close of the Permian system, an infinitely greater change took place in organic life than that which marked the ascent at any previous stage. All the species and most of the genera of the earlier races have now disappeared, and are replaced in the Trias by an entirely new series, the types of which are continued to the base of the Tertiary. Nature has entered on a new cycle, and everywhere the humbler forms of organic life have given place to forms more highly organised. It is to this system, and not to the Devonian, that we must now refer the remarkable reptiles, the Telerpeton, Staganolepis, and Hyperadapedon of the Elgin Sandstone. In the Trias formations on the Connecticut river, in New England, the footprints of no fewer than 23 species of BIRDS are enumerated by Dr Hitchcock, together with Chelonians, Batrachians, and other reptiles. In the Trias also occur the earliest traces of MAMMALS. In 1847, Professor Plieninger discovered in the upper beds of the Keuper formation, in Würtemberg, the molar teeth and bones of a small marsupial animal named *Microlestes antiquus*. In England, the animal remains in the Trias are not very numerous (only 61 species); but on the Continent, one single formation (the Muschelkalk) has already yielded 222 species, and the St Cassian beds 744 species. The flora embraces equisetums, calamites, ferns, cycadaceous and coniferous plants, but is very limited. In England and Ireland this system is the great repository of rock-salt, the layers of which, in Cheshire, in some places attain a thickness of from 75 to 100 feet. It also yields sandstone for building purposes, calcareous flagstones, limestones, and valuable beds of gypsum. The scenery of the Trias is usually tame and monotonous, and the soil better adapted for pastoral than agricultural purposes.

8. **The Oolitic System** is highly developed in England, where it consists of three very distinct formations—the Lias, Oolite, and Wealden—and stretches slantingly across the country from Dorsetshire to Yorkshire. It is evident from the character of the imbedded organisms that the first two are *marine* formations, while the last must have been deposited from *fresh water*. The characteristic fossils of the *Lias*—the lowest of the three—are cycadaceous plants, which occupy a middle position between ferns and coniferous trees, and

which here make their first appearance. The fauna wears a singular aspect, owing to the vast number of ammonites, belemnites, gryphæa, and cuttle-fishes which it embraces. Reptiles also attain their highest development in this formation, containing, as it does, those gigantic and highly characteristic forms, the Ichthyosaurus and Plesiosaurus. In 1864, the fossil fauna of this formation, as developed in the British Isles, contained, according to Professor Ramsay of the London University, 467 species. The flora of the *Oolite* in the same year comprised 128 species—consisting, for the most part, of cycadaceæ, ferns, equisetaceæ, and pines, with the new orders—cypresses, yews, dammaras, thujas, and screw-pines. Such, indeed, was the abundance of vegetation in the Oolitic age, that not unfrequently it exhibits seams of workable coal, as at Brora in Sutherlandshire, and Richmond in Virginia. Its fauna was peculiarly rich and varied, as is evident from the fact that in the British rocks alone no fewer than 1483 species were known to geologists in 1864. The marsupial or pouched animals, which first appeared in the Trias, now existed in great numbers. They were allied to the living opossum and kangaroo of the Australian continent, and formed a connecting link between birds and the placental or true Mammalia, which do not appear till near the end of the Wealden age. The *Wealden* derives its name from the "wealds" or "wolds" of Suffolk, because it prevails extensively in that country. Unlike the two underlying formations, the Wealden is essentially a fresh-water formation, and the only one of that nature occurring within the limits of the Mesozoic series. Its organic remains differ very widely from those of the Lias and Oolite—consisting of "the spoils of the river and the land, not of the sea." Among its most characteristic plants may be named the *sphenopteris gracilis* (a sort of fern), leaves of *coniferæ* and *cycadaceæ*, and fruits resembling those of palms. Of the numerous reptiles belonging to the formation are—the *Iguanodon*, a gigantic herbivorous animal, and the *Pterodactyl*, or flying reptile, which somewhat resembled a bat. But by far the most interesting fossils of the Wealden are found in its uppermost strata, near the base of the Cretaceous system—being the bones and teeth of PLACENTAL or TRUE MAMMALS, which mark another stage in the great march of creation. Including the Purbeck beds, the Wealden formation of the British Isles have yielded 253 fossil species, including 23 plants, 30 fishes, and 29 reptiles. The minerals of the Oolitic system are of considerable importance, consisting of building, paving, roofing and tile stones, alum, marble, coal, and fuller's earth. Both the Lias and Oolitic limestones are largely quarried for mortar and hydraulic cement, the latter also furnishing the best description of lithographic stones. The scenery of Oolitic districts is varied and pleasing, but wants the boldness and abruptness of Metamorphic regions. The soil is usually dry and fertile, except the Lias and Wealden clays, which in dry seasons are stiff and intractable.

9. The Cretaceous System, the highest in the great Mesozoic series of rocks, derives its name from the chalk (Lat. *creta*) that forms the main ingredient in its composition. It is a marine deposit,

and embraces two well-defined formations—the Greensand and the Chalk. The flora is not abundant, there being only 12 species known in British rocks, and even these usually consist of drifted and imperfect fragments. They exhibit, however, a great era in the progress of terrestrial vegetation, for here first occur the remains of EXOGENOUS or DICOTYLEDONOUS TREES—*i. e.*, trees having a separable bark, distinct concentric circles, increasing at their circumference, the solidity diminishing from the centre outwards, the pith enclosed in a longitudinal canal, and possessed of medullary rays. The fauna is rich, varied, and beautifully preserved. Nearly all the types of life are strictly and peculiarly Mesozoic. "Of the 521 species known in our Upper Chalk, all, with the exception of *Terebratula caput-serpentis* and a few foraminifera, have apparently become extinct during that vast period that elapsed between the close of the Cretaceous and the beginning of the Eocene epoch in England."—(Professor Ramsay.) Of the four orders into which fishes are divided, two appear for the first time in Cretaceous rocks—viz., CTENOIDS and CYCLOIDS. Reptiles, though still the dormant class of animals, have now passed their meridian; but turtles, pterodactyles, and oviparous saurians are not unfrequent. Bones of birds have been detected in some localities, as also those of QUADRUMANOUS MAMMALS, allied to our existing monkeys. Altogether, 1362 species of fossil animals were known to exist in British rocks in 1864, of which 89 were fishes and 31 reptiles. Cretaceous strata cover extensive areas in the south of England, in France, Germany, the United States, and Vancouver Island, in all of which the scenery is distinguished by the rounded outlines of the hills and valleys, which afford excellent pasturage. The origin of the chalk-beds has led to much discussion, but it is now believed to be derived from the myriads of coralline zoophytes and foraminifera with which the seas of the period abounded. The industrial products are comparatively unimportant, consisting chiefly of preparations of chalk and flint. The former, which consists of carbonate of lime, is employed by the farmer, bricklayer, and plasterer; while the latter, when calcined, is largely used in the manufacture of flint-glass and porcelain ware.

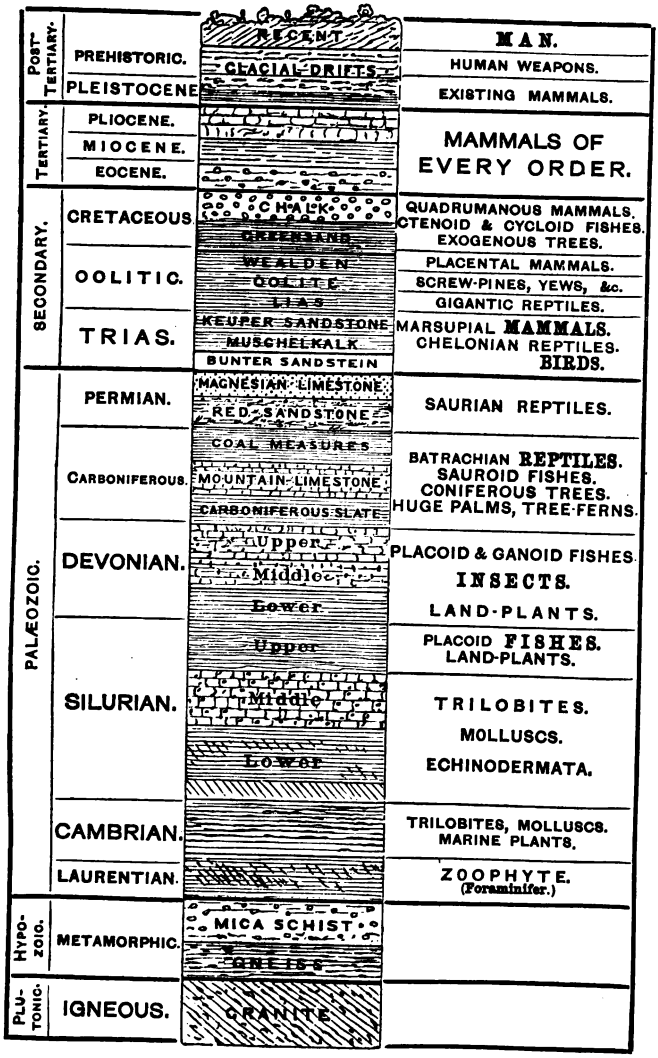
10. The Tertiary System embraces three formations—the Lower, Middle, and Upper—or, as they are more commonly called (with reference to the number of species which they respectively contain in common with our existing fauna), Eocene, Miocene, and Pliocene. These consist of vast and varied deposits — fluviatile, lacustrine, marine, and volcanic—usually found resting on one or other of the formations of the Cretaceous system. It appears evident that during their deposition important changes took place in the relative level of sea and land; that volcanic agency was developed on a vast and magnificent scale; that the portion of Europe now forming the British Isles was the site of enormous lakes, which at the present day have their best analogues in the vast fresh-water lakes of Canada; and that, during the same epoch, such a gradual refrigeration of climate took place in European countries as to admit of the existence of plants and animals similar to, or identical with,

those now existing in that continent. On entering the Tertiary strata the palæontologist finds that organic nature has undergone a complete change—that every plant and animal with which he became acquainted when studying the Secondary rocks has passed away, and that he has now entered on a wholly new stage of existence. Never before, during the pre-Adamic history of our earth, did so thorough and total a change take place in the flora and fauna of the globe (see under "Triassic System," p. 46). The flora is distinguished from that of the older epochs by the abundance of dicotyledonous trees (oaks, beeches, elms, &c.), a few leaves and fragments only of which have as yet been detected in the Cretaceous rocks, and even these are of wholly different species. The monocotyledons, especially palms, also become greatly more numerous; while the conifers, previously so abundant, no longer occupy a prominent place. In the Eocene formation alone, in which between 200 and 300 fossil plants have been detected, no fewer than one-half are dicotyledons. The fauna of the system is equally characteristic. It was pre-eminently the age of mammalia; for, though mammals, both marsupial and placental, are known to have existed in the Secondary ages, only a few vestiges of either occur in formations lower down than the Eocene. In this single formation—that to which the London and Paris basins belong—no fewer than 25 genera of this class of vertebrata were known in 1856. Altogether, upwards of 100 genera of mammals occur in the Tertiary rocks; and, what is still more remarkable, all the existing orders of the class are represented, though unequally. The pachydermata were especially numerous, embracing the uncouth *palæotherium, anoplotherium, deinotherium, mastodon,* and *mammoth.* It was among the pachydermata of the Paris basin that the illustrious Cuvier effected those wonderful restorations which, in the beginning of this century, gave such an impetus to palæontology. Several species of birds, chiefly from the Eocene of Paris, have been described, the most remarkable of which is the gigantic *gastornis Parisiensis,* a form intermediate between the wading and aquatic orders. The reptiles resemble the existing crocodile, alligator, and gavial. The fishes embrace the four orders—placoids, ganoids, cycloids, and ctenoids—but appear to be almost without exception of different species from those now peopling the ocean. In England, Tertiary strata cover nearly all the basin of the Thames, as also Hampshire and the northern part of the Isle of Wight, but they scarcely exist in Scotland and Ireland. For their distribution in Southern Europe see at p. 80. The industrial products are various, comprising building-stone, marble, limestone, gypsum, brick-clay, potter's clay, pipe-clay, millstones, lignite or "brown coal," and amber.

11. The Pleistocene or Boulder Clay.—It would appear that, after the deposition of the Eocene, Miocene, and Pliocene formations, a great change took place in all the higher latitudes of the northern hemisphere in regard to the relative distribution of sea and land; that a large portion of Europe and of the British Isles was gradually submerged beneath the waters, the summits of the loftier

mountain-ranges appearing as islands in mid-ocean; that a corresponding elevation of land occurred simultaneously in the Arctic regions, accompanied by a change in the direction of the great ocean-currents, and by a great diminution of temperature over all Northern Europe; that enormous icebergs—laden with gravel, sand, and gigantic boulders—were annually disengaged from the Arctic shores, which, floating southwards, discharged their miscellaneous contents over the recently-submerged lands; that this submergence and accompanying change of temperature caused the destruction of by far the greater number of the plants and animals which existed in North Europe in the Miocene and Pliocene ages—their places being supplied, however, to some extent, by the fauna and flora now peculiar to more northern latitudes; that after this state of things had continued for ages, the submerged lands of North Europe and the British Isles were again gradually elevated to their present level; and that, finally, the glacial epoch having passed away, a new flora and fauna, suited to the new conditions, made their appearance—many of the species of which continue to exist to the present day. The organic remains of the boulder clay are by no means numerous. In the British Isles they occur chiefly in the Norwich Crag, Lancashire, North Wales, Isle of Man, the banks of the Clyde, Caithness, and in the north and east of Ireland. On the Continent the main localities are Scandinavia, Russia, and North Germany; while similar deposits are found in Sicily, North America, Patagonia, and Tierra del Fuego. The Pleistocene beds contain very few recognisable remains of plants, but some of the species still exist among our aboriginal trees; as, for example, the Scotch fir and the common birch. Others continue to hold their place in the forests of North-western Europe; as *Abies excelsa*, or the Norwegian spruce, which is found rooted in the Norwich Crag. In general, the coniferæ alone appear to have flourished during the entire era of the boulder clay. The fossil fauna is more abundant, but consists for the most part of mollusca; though in the fresh-water beds numerous remains of mammals occur, the greater number of which have become extinct. The total number of marine testacea in the Norwich Crag does not exceed 76 species, of which only one-tenth are extinct; while of the 14 fresh-water species associated with them, all appear to be now living, either in the British seas, the Boreal, or the Arctic regions. No fewer than 37 species of mammals are enumerated by Professor Owen as occurring in the caves of the British Isles; and of these, he says, 18 species have become extinct, while the remaining 19 continue to survive in the British archipelago, or on the Continent. The entire fauna of the glacial beds, as given by Dr Edward Forbes in the new edition of the 'Physical Atlas,' amounts to 170 species. These are chiefly mollusca, but the number includes several birds, and not a few extinct mammals; but the horse, goat, ox, red deer, badger, fox, wild-cat, and several other species known to have existed in the Pliocene era, survived the storms of the Pleistocene, and now form a living bridge connecting the present epoch with the immeasurable ages of the past.

SUCCESSION OF LIFE.



12. Prehistoric Formation.—A deeper interest attaches to this formation than to any other in the entire geological scale. Here are found the earliest traces of the existence of MAN on the earth—as pile-dwellings, tree canoes, flint arrow-heads and other stone implements manufactured by human hands. No clear line of demarcation separates this formation from the Pleistocene, and in the present state of science it cannot be positively determined in what century or millennium those implements were fabricated. There can be little doubt, however, of the vast antiquity of some of them, as proven by Sir Charles Lyell and others. The antiquity of the human species, as thus indicated, no doubt conflicts with the chronology of Usher, founded on our modern Hebrew text. In the matter of antediluvian chronology, however, the Hebrew text has in all probability been vitiated, as we have shown at large in a separate work ('Facts and Dates,' p. 62-69). The Septuagint translation—a translation made from an uncorrupted text, and sanctioned by our Lord and His apostles—assigns to our race an antiquity of nearly 1500 years more than Usher does. Science is giving its emphatic verdict, in this particular, in favour of the Septuagint; and though the extended chronology may fail in meeting all the difficulties of the case, it will certainly meet many of them. In the mean time we cordially adopt the words of a recent brilliant writer when he says, "The theology of science is at present in its infancy, and consequently liable to multitudes of errors. When the theologian shall have become more conversant with God's works, and the scientific man more of a theologian, we shall obtain more light."—('Old Bones,' by Rev. W. S. Symonds, F.G.S.)

8. BOTANY.—Physical Geography does not concern itself with the structure and classification of plants, but confines its attention to their existing number, to the various modes by which they have been disseminated, to the external causes which affect their distribution, and to the more or less limited areas to which the different species and families are confined.

Number of Species.—The number of species presently known to botanists probably exceeds 120,000; but the progress of discovery is so rapid, and the parts of the earth's surface still uninvestigated so extensive, that 200,000 appears to be a very moderate calculation of the number of species actually existing. Theophrastus (B.C. 390) knew only 500; Pliny (A.D. 79) increased the number to 1000; the naturalists of the middle ages contented themselves with a description of 1400; the celebrated Linnæus, in 1753, swelled the number to 5938, and in 1762, to 8800; while Wildenow, in 1807, raised the number to 20,000. During the present century the progress of the science has been remarkable. In the year 1820, the number of species in the herbarium of the *Jardin des Plantes*, at Paris, was estimated at 56,000. In 1847 the collection of M. Delessert, of the same city, contained about 86,000 species. In 1844, Steudal, the German botanist, estimated the total number of known forms at 95,000; while in 1869 the number of recognised species was 120,000, of which 103,000 were flowering, and 17,000 flowerless.

Humboldt estimates the total number of existing plants as at least 200,000.

Antiquity of Species.—The geologist can demonstrate that all the species of the existing flora were not created simultaneously, but were introduced at successive stages as the surface and temperature of the earth became fitted for their reception. They are, therefore, of very different degrees of antiquity; for while they all appear to have been denizens of the earth ever since the creation of man, most of them were ushered into being prior to the time in which our existing continents acquired their present configuration; and a very few of them can be traced back to the earliest Tertiary ages. Those species are reckoned the oldest which combine simplicity of organisation with great width of distribution, as our common grasses and rushes, together with mosses, lichens, fungi, and ferns; while those that are confined to small areas—notwithstanding the contiguity of land having a suitable climate, and their being endowed with the requisite means of transport—are considered the most recent.

Centres of Creation.—Most people seem to be of opinion that all, or nearly all, the plants found in any particular locality, were originally created there. The great Swedish botanist, on the other hand, believed that the progenitors of all the existing plants were created in some one particular region, from which they were gradually disseminated over the earth's surface. Innumerable facts can be adduced by modern science to show that each of these hypotheses is equally untenable; and most naturalists are now of opinion that there were numerous *specific centres*, situated in numerous and widely-separated localities, each centre being the birthplace of one species, or assemblage of species, which continues to grow there in greater perfection than in any other region to which, by the various transporting agents known to exist, it was subsequently wafted.

Modes of Dissemination.—Many plants are possessed of means by which they can diffuse themselves over areas more or less extensive. Some have seeds with winged or feathery appendages, which enable them to float on the air; other seeds are so small as to be borne by winds to very distant localities; very many are transported by rivers, streams, marine currents, and even icebergs, to very remote regions, where, if the soil and climate be suitable, they take root and propagate their species; while not a few adhere to the hairy coatings of migratory animals, or, entering into the gizzards of birds of passage, retain their vitality after being voided by them in distant localities. The agency of man has also, in all ages, been very effectual in the dissemination of plants; for example, the passage of armies from one country to another, commerce by sea with foreign nations, the discovery of previously unknown lands, and the planting of colonies in distant regions. But all these agencies, singly or combined, cannot adequately account for the present distribution of the species, without supposing a multiplicity of original specific centres.

Areas of Distribution.—In whatever way the vegetation of the globe was originally disseminated, its present distribution is such

that the individual species are confined to particular portions of the surface characterised by a certain temperature and other climatic conditions. The area within which a given plant prevails is called its *habitation*, or *area of distribution*. In or near the centre of this area it attains its highest development; it degenerates when far removed from this centre; and when transported beyond the limits of the area it languishes and dies. Though each species of plant has a nature peculiar to itself, the soil, temperature, and climatic conditions of the various portions of the earth's surface are so various, that each species finds for itself a perfectly suitable habitation. These habitations, or areas of distribution, are of all sizes; embracing in some cases a large section of a continent, or of several continents, and being limited in others to the merest speck of land. For example, a considerable number of plants of Northern Europe occurs also in Siberia and British North America; some British species are found at high elevations on the Himalaya Mountains; and one species—the *Epilobium tetragonum*—is common to Britain, Canada, and Tierra del Fuego. On the other hand, the Cape of Good Hope, California, and certain regions of the Andes, have respectively certain species peculiar to themselves; as also Madeira, the Canaries, St Helena, the Sandwich and Society Islands, &c. The same species of plant seldom occurs in widely-separated countries, however closely the soil and climate of both may approximate; but *similar* species of the same genus are, in such circumstances, rarely absent, and these are spoken of by botanists as *representative species*. Thus the heaths of Europe are represented by other species of the genus *Erica* in S. Africa; and the violets of North America represent those of Britain, which are specifically different.

Botanical Regions.—Various attempts have been made by botanists to divide the globe into certain well-defined *regions*, founded on their characteristic vegetation. Wildenow, De Candolle, Meyen, and especially Schouw, have distinguished themselves in this department of science. The last-named naturalist, about thirty years ago, proposed to divide the earth's surface into what he calls "Phyto-geographic regions." These, according to him, are 25 in number, and characterised as follows: 1. At least one-half of the *species* found in each region must be peculiar to it. 2. One-fourth of the *genera* must be peculiar to it, or at least be more prevalent there than elsewhere. 3. Some of the *orders* must either be peculiar to it, or reach their maximum in it. Each of the different regions receives three separate designations: the *first* indicating its botanical character; the *second* its geographical position; while the *third* is named after some eminent botanist.

1. *Region of Mosses and Saxifrages*, the Arctic-Alpine flora, or Wahlenberg's region; embracing all the countries situated within the Arctic Circle, together with the higher elevations of the mountain-ranges of W. and S. Europe. 2. *Region of Umbelliferæ and Cruciferæ*, North-European and North-Asiatic, or Linnæus's region; embracing that large portion of the area of the Old World which lies between the Polar Circle and lat. 45° N., and between the Atlantic and Pacific Oceans. 3. *Region of*

Labiatæ and Caryophyllaceæ, Mediterranean flora, or De Candolle's region; embracing Southern Europe, Asia Minor, Syria, N. Africa, Madeira, Azores, and Canaries. 4. *Region of Asters and Solidagos*, Northern North-American, or Michaux's region; extending from the Atlantic to the Rocky Mountains, and from lat. 35° N. to Lake Winnipeg and St James Bay. It embraces the greater part of Canada and the N.E. part of the United States. 5. *Region of Magnolias*, the S.E. North-American flora, or Pursh's region; comprising the remainder of the United States lying E. of the Rocky Mountains. 6. *Region of Camelliaceæ and Celastraceæ*, the Chino-Japanese, or Kämpfer's region; embracing Japan, Corea, and the N.E. part of China. 7. *Region of Scitamineæ and Zingiberaceæ*, the Indian flora, or Roxburgh's region; embracing Hindustan, Further India, and the S. of China. 8. *Region of Rhododendron trees*, the Emodic, or Wallich's region; comprising the flora of the S. slopes of the Himalaya, from the altitude of 5000 to 12,000 feet. It includes Sirmur, Gurwhal, Kumaon, Nepal, and Bhotan. 9. *The Malaysian flora*, or Reinwardt's region; embracing Northern Australia and the Malay Archipelago, with the exception of Sumatra, Java, and the S. of Borneo. 10. *Javanese flora*, or Blume's region; embracing Java, Sumatra, Timor, and the S. of Borneo. 11. *Oceanic* or *Polynesian flora*, or Chamisso's region; embracing all the islands of the Pacific Ocean within the tropics. 12. *Region of Balsamic trees*, Arabian, or Forskal's region; embracing the S.W. of Arabia, the E. of Abyssinia, S. of Persia, Beluchistan, and Sindh. 13. *The Desert*, or Delile's region; comprising the Sahara, and all Arabia except the S.W. angle. 14. *Region of Tropical Africa*, or Adanson's region; embracing the whole of Africa between the Tropic of Capricorn and the 15th deg. of N. latitude, with the exception of Eastern Abyssinia. It also includes Madagascar. 15. *Region of Cactaceæ and Piperaceæ*, Mexican, or Jacquin's region; includes Mexico, Central America, New Granada, Ecuador, Peru, Venezuela, Guinea, and the N. of Brazil, with the exception of the higher elevations of the mountain-chains. 16. *Region of the Highlands of Mexico*, or Bonpland's region; those parts of Mexico and Central America which have an elevation of more than 5000 feet. 17. *Region of Cinchonæ, or medicinal herbs*, the Andes, or Humboldt's region; embracing the elevated regions of the Andes, from 5000 to 9000 feet high, and extending southward to the Tropic of Capricorn. 18. *Region of Escallonieæ and Calceolariæ*, or Ruiz and Pavon's region, embraces the highest elevations of the last-mentioned range, or above 9000 feet. 19. *The West Indian flora*, or Swartz's region; embracing all the islands of the West Indies. 20. *Region of Palms and Melastomaceæ*, Brazilian, or Martius's region; embracing all South America between the Andes and the Atlantic, and between the Tropic of Capricorn and the 15th region. 21. *Region of Arborescent Compositæ*, Extra-tropical South-American, or St Hilaire's region; embracing South America between the Tropic of Capricorn and Patagonia. 22. *Patagonian* or *Antarctic Region*, D'Urville's region; embracing Patagonia, Tierra del Fuego, and the Falkland Isles. 23. *Region of Stapeliæ and Mesembryanthema*, South African, or Thunberg's region; including the whole of Africa S. of the Tropic of Capricorn. 24. *Region of Eucalypti and Epacridaceæ*, Australian, or Brown's region; including Southern Australia and Tasmania. 25. *Region of New Zealand*, or Forster's region; embracing the islands of New Zealand.

9. ZOOLOGY.—Zoological Geography is closely allied to Botanical Geography, being that branch of the science which treats of

the habitats, limits of distribution, and dispersion of animals, as they at present exist on the globe.

Number of Animals.—The barriers in the way of obtaining accurate statistics of the number of animal species are even greater than in the case of plants; and naturalists accordingly vary greatly in their estimates, not only of the probable number presently existing, but also of the known and described species. This statement need not excite surprise when we consider that many regions of the globe remain almost wholly unknown, while others have been but imperfectly explored; that whilst the habitat of plants, when once discovered, can be visited and revisited by the botanist at pleasure, the great majority of animals are endowed with the powers of locomotion, and evade the pursuit of man; that myriads of species are too minute to be seen by the naked eye, while others are too fleet or too formidable for being accurately observed; that age and sex produce such changes in their appearance as often to render it doubtful whether or not the species are identical; that many of them have their home in the depths of the ocean, or conceal themselves in the sand on the sea-shore; while others seek shelter in the impenetrable recesses of the forest, or in inaccessible mountain-cliffs. The number of known species of vertebrated animals, according to Dr Keith Johnston's 'Physical Atlas,' published in 1856, is as follows: Mammals, 1704; birds, 6226; reptiles, 657; fishes, 8000 — total, 16,587. Wagner and Waterhouse, in 1848, gave the number of known mammals at 1967; birds, 8000; reptiles, 1600; and fishes, 8000—total, 19,567. The probable number of existing Vertebrata may therefore be estimated at about 20,000. The other divisions of the animal kingdom are far more uncertain. Thus, while Woodward, writing in 1851, gives the number of recent Mollusca at 12,000, and the fossil species at 15,000, others maintain that no fewer than 20,000 recent species are to be found in certain existing collections. Keferstein (in 1834) assigns 1000 as the number of known species of Radiata, including the polypi, entozoa, acalepha, and echinodermata; while Swainson, in 1840, gives the number at 2500. But by far the greatest discrepancy prevails in regard to the Articulata (embracing annellida, crustacea, arachnides, and insecta), some authors stating the number at 120,000, others at 400,000, and some even as high as 550,000, the great majority of which, however, are Insects. Besides these, there exist innumerable hosts of infusoria or animalcules, a class of microscopic animals belonging to the sub-kingdom Radiata, and found in countless numbers in vegetable infusions. Omitting from our reckoning the insects and infusoria, of the actual number of which we can form no probable estimate in the present state of science, the following may be taken as a tolerable approximation to the *existing number* of animals: Vertebrata, 20,000; Mollusca, 20,000; Radiata, 5000; Articulata, 5000—total, 50,000 species. M. Agassiz, one of the most eminent of living naturalists, estimated, in 1850, the total number of *known species*, including insects, at 250,000.

Distribution of Animals.—Though animals are endowed with the power of voluntary motion, and are therefore more capable than

plants of transporting themselves from one region to another, various causes combine to limit the actual extension of individual species. Difference of climate, and the greater or less facility of procuring subsistence, are amongst the foremost of those causes; while in regard to land-animals, arms of the sea and elevated mountain-chains present formidable barriers to migration. In numerous instances, however, we can trace the operation to no secondary cause, and little can be advanced beyond conjecture as to the way and manner in which a large proportion of the species came to be located in the precise regions where they are found; unless, as in the case of plants, we assent to the doctrine of numerous *centres of creation*. In no other way can science satisfactorily resolve the question how quadrupeds, for example, and other animals incapable of crossing arms of the sea, have found their way to islands situated in mid-ocean; whilst in regions very remote from each other, but having a similar climate, the species, instead of being identical, are merely analogous.

Zoological Kingdoms.—Naturalists divide the surface of the globe into six zoological kingdoms, which are subdivided into fourteen zoological provinces. Approximately, the six kingdoms correspond respectively with the six continents of the globe—viz., Europe, Asia, Africa, North America, South America, and Oceania. North and South America are indeed usually comprised under one kingdom, thus reducing the number to five; but simplicity of arrangement, and the convenience of the student, render the other division preferable.

The first, or EUROPEAN KINGDOM, embraces the whole of insular Europe, and is subdivided into three zoological provinces—viz., *Arctic, Central,* and *Southern Europe*. The second, or ASIATIC KINGDOM, includes continental Asia, with the exception of Arabia, extends from the Urals and the Volga to the Pacific, and embraces four provinces—viz., *Arctic, Central,* and *Tropical* Asia, together with Asia Minor and Syria, which last is designated the *Transition Province*, as its fauna combines the characteristics of Asia, Europe, and Africa. The third, or AFRICAN KINGDOM, consists of but one province, which embraces the entire continent of Africa, together with Arabia, Madagascar, Bourbon, and Mauritius. The OCEANIC or AUSTRALIAN KINGDOM embraces the whole of Oceania, and is subdivided into two provinces—viz., the *Malaysian*, which forms a connecting link between the Asiatic and Australian kingdoms; and the *Melanesian*, whose fauna is of a very peculiar character. The fifth, or NORTH AMERICAN KINGDOM, embraces the whole of that continent north of the Mexican States, and contains two provinces, the first of which comprehends Alaska, and British and Danish America, and the second the United States. The sixth, or SOUTH AMERICAN KINGDOM, embraces not only the whole South American continent, but also Mexico, Central America, and the West Indies. It consists of two provinces of very unequal dimensions—viz., *Tropical America*, which extends from the north of Mexico to lat. 40° S.; and *Austral America*, embracing Patagonia, Tierra del Fuego, and the Falkland Isles.*

* For fuller details regarding the limits and characteristics of these provinces, we must refer the student to the zoological sections of this work, under the six continental divisions of the globe.

The following Table,* which is adapted with modifications from Milner's 'Universal Geography,' exhibits the distribution of the several orders of Mammalia in the six zoological kingdoms :—

DISTRIBUTION OF THE MAMMALIA.

Orders of Mammalia.	Total No. of Species.		Europe.		Asia.		Africa.		North America.		Central and South America.		Oceania.	
	Phy. Atlas.	Wagner and Water.	No. of Species.	Per. Species.	No. of Species.	Per. Species.	No. of Species.	Per. Species.	No. of Species.	Per. Species.	No. of Species.	Per. Species.	No. of Species.	Per. Species.
Quadrumana	170	186	1	—	49	49	63	62	—	—	74	74	—	—
Carnivora .	514	731	64	20	276	224	174	151	101	88	188	180	8	8
Marsupialia .	123	140	—	—	4	4	—	—	4	3	28	27	105	105
Rodentia . .	604	604	61	21	185	126	104	94	118	113	166	161	21	19
Edentata . .	28	34	—	—	5	5	6	6	1	1	20	19	3	3
Pachydermata	39	38	1	—	17	16	18	17	—	—	4	4	—	—
Ruminantia .	151	159	14	7	67	59	65	62	13	9	13	12	—	—
Cetacea . .	75	75	24	7	29	9	16	7	24	4	25	14	13	8
Total No. of species	1704	1967	165	55	632	492	446	399	260	218	518	491	150	138

10. ETHNOGRAPHY.—Man, from the perfection and beauty of his bodily organisation, and from the order of time in which he was called into existence, occupies the apex of the vast pyramid of animal life. Of all animals he only walks erect, his eye reflecting earth and sky, and his look glancing freely over that world in the midst of which he lives and reigns. Over his whole form there is an air of more than material beauty, the reflection of a soul infinitely rich in thought and emotion; while by possessing an immortal spirit he is raised immeasurably above material things, and separated, as by an impassable gulf, from all other animals. In common with these, he is, to some extent, subject to the influence of external circumstances, though in a less degree than any other species. His superior intelligence, and the pliancy of his constitution, fit him to become the denizen of all countries, and all varieties of climate, from the scorching heat of the tropics to the rigorous cold of Arctic latitudes. His geographical distribution, accordingly, differs from that of all other organic beings, and man is the only

* The *first* column of figures shows the total number of species belonging to each order, according to Johnston's 'Physical Atlas;' the *second*, the total number, according to Wagner and Waterhouse, on whose statistics the whole remainder of the table is based; while the second division of the other columns shows the number of species that are peculiar to each zoological kingdom.

true cosmopolite. Of the vast number of countries brought to the knowledge of Europeans by modern discovery, very few were found uninhabited; the principal exceptions being Iceland, Spitzbergen, and Novaia Zemlia; Madeira, the Azores, and St Helena; the Falkland Isles, the Galapagos, some minor groups in Polynesia, and the inhospitable regions around the South Pole.

Unity of the Species.—Man is of only one species, and the so-called *races* of men are mere varieties of the same species, differing less from each other than do the varieties of many other animals; as, for example, the dog, the horse, the sheep, and the domestic fowl. Science and Revelation alike proclaim this fundamental truth: the one, by establishing an identity of anatomical structure between the races, the same period of gestation, the same instincts, longevity, and diseases, the same mental and moral character, and the fertility of offspring arising from intermixture of blood: and the other, by declaring that in one man was the germ of the whole human family; that the myriads of men that now people the earth, after the lapse of a hundred and fifty generations, are all *brethren*, united together by the closest ties; and that the universal depravity and death which have their root in the common ancestor of all, are more than counterbalanced by the obedience and sufferings of his glorious Descendant, whom every human being can claim as his near kinsman.

Origin of Races.—Yet in all ages and countries the individuals of the human family have presented numberless diversities of appearance; and though all are specifically identical, every member of the family exhibits his own proper *individuality*—that is to say, certain characteristics of physical organisation and of mental disposition that distinguish him from every other individual of the species. For Man is a complex being, and embraces within him a world of diverse elements, that rival, in their various riches, the world of external nature. These elements are capable of combination in infinitely varied proportions. In one the soul predominates, in another the body; here the nervous system bears rule, there the arterial; here the affections, there the understanding. The laws and the causes, however, that determine these combinations, are to us a secret; for individuality is a mystery of life, the stamp of the Creator. This much, however, seems certain,—viz., that while the distinctive character of the soul never fails to manifest itself very perceptibly in the entire physical organisation—especially in the form of the head and in the physiognomy—the influence of external nature, of the family, of society, of habit, and of education, is but of secondary importance, tending merely to modify the original individuality. Yet, by a constant and unvarying repetition, carried on through a long series of generations, even the latter influences may produce very important effects; though never to the extent of eradicating the outlines of this individuality, which, notwithstanding the constant intermingling of blood by marriage, perpetuates itself for ages

from father to son, in the same family, every member of which resembles, both in temperament and physical organisation, some one or other of his ancestors or blood relations. Accordingly we find that, from the earliest dawn of history, mankind has been divided into races,* and organised into nations; and it is one of the first lessons of Revelation that with this division human design and human choice had nothing whatever to do,—that it was exclusively the work of the Creator, with nature to aid in its accomplishment,—and that these races and nations were distributed over the earth's surface according to a definite plan, in which each had assigned to it its proper part in the progress of events. Each region, moreover, strengthened and modified the character of the race that was conducted into it; and thus national characteristics, which become more and more marked as generations succeeded each other, attained at length such a degree of fixedness and inflexibility as has enabled them to traverse the ages of history, and encounter the most opposite influences, without undergoing any radical change.

Dispersion of Nations.—The precise locality in which the dispersion of nations originated, and the precise date at which it took place, are not easily determined; but there can be no doubt that we must look for the former to Western Asia, and for the latter to the fifth generation after the Deluge.† Asiatic Turkey, situated in the centre of the Old World, and midway between its four great oceans, has been twice the cradle of mankind, and still remains the region in which the human form attains its highest perfection. Here Noah with his family, the sole survivor of that great catastrophe which swept away the inhabitants of the antediluvian world, took up his destined abode; and here his three sons—Shem, Ham, and Japheth—like branches cut from the same tree, took root and flourished, containing within themselves the germs of the three great races, and of all the minor varieties, that subsequently peopled the earth. The distinctive characteristics of the ancestors were indelibly impressed on their respective descendants: thus spiritual and religious tendencies predominated in the offspring of Shem; the sensual and corporeal in those of Ham; while the nations that sprung from Japheth have been no less remarkable for their fuller development of all the powers of the mind. Accordingly, when the set time for the great dispersion arrived (B.C. 2552, according to W. Osburn), Ham and Japheth wandered far from the ancestral home, in quest of abodes congenial to their respective natures; while Shem retained possession of the paternal altars, became the custodier of the one true faith, and the ancestor of that promised Seed of the Woman in whom all nations of the earth shall yet be blessed. Regarding this distribution from another point of view, we observe a curious and remarkable anomaly; for while all the other types of animals, as also of plants, go on decreasing in perfection from the equator to the poles, man presents to our view his most perfect type at the centre of the north temperate zone, in that region of the

* For an important modification of this statement, see 'Facts and Dates,' p. 121.

† The Hebrew Bible apparently gives the date of the Deluge as B.C. 2288; the Septuagint as 3216; while the Great Pyramid at Jeezeh indicates an almost exact mean between them, giving it as B.C. 2800.

Caucasus above alluded to; whereas, departing from that region, whether to the north, south, or east, the types gradually lose their symmetry, till, at the remote extremities of the continents, we find the most deformed and degenerate races.

Number and Characteristics of Races. — Modern Ethnography classifies the numerous nations that people the globe into three primary races—viz., the Caucasian, or white and bearded race; the Mongolian, or tawny and beardless race; and the Negro, or black-skinned and woolly-haired race. These are confined to the Old World, and correspond, with certain limitations, to its three continental divisions; the Cacausians occupying nearly all Europe, south-western Asia, and the north of Africa, and extending from Iceland and the Atlantic to the Ganges and Brahmapootra, and from the Arctic Circle to the Tropic of Capricorn; the Mongolians peopling all the rest of Asia, together with certain isolated localities in central and northern Europe; and the Negro race, the whole of continental Africa south of the Tropic of Cancer. In addition to these there are several minor varieties, inhabiting Oceania and the New World, and probably originating in the intermixtures and modifications of the three primary races: as the Malayans in Malaysia and Madagascar; the Papuans in New Guinea and New Hebrides; the Maoris or Australians in Australasia; and the Americans, or aboriginal inhabitants of North and South America. The more prominent characteristics of the principal races are the following:—

CAUCASIAN RACE.—The head almost round, or somewhat oblong; skull symmetrical, of great capacity, and high facial angle; face oval, and the features moderately prominent; the forehead arched; the nose narrow, and the bridge somewhat convex; the mouth small, with the lips slightly turned out (especially the lower one), and the outlines gracefully waved; the front teeth placed perpendicularly in the jaws; the chin full and round; skin fair and ruddy, or of different shades of brown; hair abundant on head and chin, but dispersed thinly over other parts of the body; colour various, according to complexion, from a yellow-red auburn and deep brown to glossy black; eyes blue or hazel to dark brown and black; stature of medium size, approaching 6 feet in the fair varieties, but several inches less in the dark. Muscular strength great; intellect highly developed. Languages polysyllabic, copious, and highly inflexional. This type is divided into two branches, the *Indo-European* or Japhetic branch, and the *Syro-Arabian* or Semitic branch. For a fuller description of these we refer the student to the ethnographical sections of Europe and Asia.

MONGOLIAN RACE.—Head of a heavy form, though not large; skull square-shaped, rather angular than rounded, its capacity much smaller than the Caucasian, with the facial angle sloping backward; face broad and flattened, cheek-bones projecting, nose flat, space between the eyes flat and very broad; chin prominent; lips well formed; eyes, small, dark, and placed obliquely; skin of an oval tint, never very fair nor intensely swarthy; hair coarse, lank, and black; the beard scanty, not curly, and wanting at the ears; hair scanty on other parts of the skin; stature somewhat low, trunk long, and the extremities rather short. Strength and endurance less than in the Caucasian; intellect moderately developed, but shrewd, sagacious, crafty, and insincere; more obstinate than brave, and extremely cruel to vanquished foes; imagination and taste deficient; imitative and skilful in the domestic arts, but without any scientific enterprise; content with a stationary civilisation; fond of horseback, sluggish, and dirty. Languages inartificial, limited in range of literature, and divided into two principal families—the *Monosyllabic*, which is destitute of inflexions, and the *Finno-Tartarian*, which is slightly inflexional and phonetic. Religious aspirations obtuse, the forms being various, as Buddhism, Shamanism, Polytheism and Mohammedanism.

NEGRO OR ETHIOPIAN RACE.—Skull thick and heavy, compressed at the sides, and elongated from front to back; the forehead convex, retreating, and narrow, with facial angle lower than in the Mongolian type; cheek-bones projecting forward; both jaws much elongated, with the front teeth of the upper turned obliquely forward; mouth wide, and lips very thick; the chin retracted; eyes black and promenent; skin varying from a deep sallow to intense black, and emitting a strong, offensive odour, but soft and silky to the touch; hair of a crisp, woolly texture, and curly on the head, generally destitute on other parts of the body; beard scanty on the upper lip, and chiefly confined to the chin. Body strong, muscular, and often very symmetrical; the arms somewhat elongated; feet broad, heavy, and flat-soled. Intellect without depth or comprehensiveness, but acute and perceptive; patient, submissive, affectionate, honest, cheerful, and contented; well adapted for all domestic and agricultural employments, but do not excel in arts, navigation, or commerce, and have never arrived at a high civilisation. Languages agglutinate, slightly inflexional, but one stage removed from the simplest monosyllabic, and without a written literature. Religion fetichism or demon-worship, but Mohammedanism among the northern tribes; in a civilised state, however, they are susceptible of deep devotional feelings.*

Population of the Globe.—The population of the entire globe cannot, as yet, be stated with anything like accuracy, as many regions still remain unexplored, and as, beyond the limits of Europe, correct census of the population are almost wholly unknown. According, however, to the most recent estimates, it amounts to 1365 millions, that of the different continents being as follows:—

Continents.	Area in English Square Miles.	Population by latest Estimates.
Europe, ...	3,843,686	288,349,896
Asia, ...	16,427,015	784,728,500
Africa, ...	11,556,300	188,000,000
North America, . . .	8,669,688	56,998,795
South America, .	7,028,206	27,170,932
Oceania, ...	4,500,000	20,000,000
Total, ...	52,024,895	1,365,548,123

Religions of Mankind.—The following estimate has been made of the numbers professing each of the principal religions now existing; but they can be viewed as only a rough approximation to the truth:—

Roman Catholics,	175,000,000	
Protestants,	112,000,000	
Greek Church,	90,000,000	Christians, 400,000,000
Minor Christian Sects,	23,000,000	
Jews,	7,000,000	Jews, 7,000,000
Mohammedans,	145,000,000	Mohammedans, 145,000,000
Brahmins,	225,000,000	
Buddhists,	395,000,000	Heathens, 735,000,000
Other Pagans,	115,000,000	
Not accounted for,		78,000,000
Population of the Globe,		1,365,000,000

* For a description of the sub-varieties above enumerated, the student is referred to the sections of this work treating of America and Oceania.

PART III.

POLITICAL GEOGRAPHY.

EUROPE.

1. Boundaries.—North, the Arctic Ocean; West, the Atlantic; South, the Strait of Gibraltar, the Mediterranean, Sea of Marmora, Black Sea, and Mount Caucasus; East, the Caspian Sea, the River Ural, the Ural Mountains, and the River Kara.

Continental Europe lies between the parallels of 36° 1′ and 71° 9′ N., and between the meridians of 9° 30′ W., and 65° E.; it occupies 35° 8′ of lat. and 74° 30′ of lon., and, with the exception of Lapland and part of the government of Arkhangel, is wholly included within the north temperate zone. But insular Europe, including Iceland, Spitzbergen, the Azores, Candia, &c., embraces a much larger area—viz., from lat. 34° 55′ (Candia) to 80° 48′ (Spitzbergen), and from lon. 31° 18′ W. (Azores) to 65° E. (Ural Mountains),—being in all, 45° 53′ of lat. and 96° 18′ of lon. Grodno, in Russia, in the centre of the continent, is nearly in the same latitude as the centre of Ireland, the south of Labrador, the north of Lake Winnipeg and Queen Charlotte Island, and as Tula, Uralsk, and the middle of Lake Baikal; and nearly in the same longitude as Hammerfest, Tornea, Riga, Lemberg, Klausenburg, Athens, and the east side of Tripoli and Cape Colony. The south-east corner of Sweden is the centre of insular Europe.

2. Form, Dimensions, Extreme Points, and Coast-Line.—Europe is an immense peninsula jutting out from Western Asia, and broken up into a great number of smaller peninsulas, the principal of which are: The Scandinavian, bet. the Baltic and Atlantic; the Danish, bet. the Baltic and North Sea; Brittany, bet. the English Channel and Bay of Biscay; the Spanish, bet. the Atlantic and Mediterranean; the Italian, bet. the Adriatic and Tyrrhenian Sea; the Hellenic Peninsula with Istria and the Morea, bet. the Adriatic and Black Sea; and the Crimea, bet. the G. of Odessa and Sea of Azov. The peninsulas occupy one-fourth of the entire area of the continent.

All these, with the single exception of the Danish, stretch out in a southerly direction, and have mountain-ranges occupying their entire length. This remarkable law holds good with almost all the peninsulas

of the globe. The extreme length of Europe, from Cape St Vincent in Portugal to Orsk in the Ural Mountains, is 3400 miles; extreme breadth, from North Cape in Lapland to Cape Matapan in Greece, 2450 miles. Cape Nordkyn in Norway is the most northern point of the continent; Punta da Tarifa, near Gibraltar, the most southern; Cabo da Roca, in Portugal, the most western; and the Urals, in Perm, the most eastern. Owing to its peculiar form and numerous deep indentations, the coast-line greatly exceeds in proportion that of every other continent. It is estimated at nearly 17,000 miles, being one mile of coast to every 225 miles of surface; while Asia has only one to every 550 miles; Africa, one to every 710; and America, one to every 490. The continental boundary does not exceed 2500 miles. It is in a great measure owing to this peculiarity of surrendering herself to the ocean, and her central position in the terrestrial hemisphere, that Europe owes her high civilisation and unrivalled commercial prosperity.

3. Area and Population.—The total area of Europe, including the islands, is estimated at 3,843,686 sq. miles, or considerably less than one-fourth the size of Asia. Hence, reckoning the arc of Oceania at 4,500,000 sq. miles, Europe is the smallest of the six great divisions of the globe, of the land-surface of which it embraces only a fourteenth part. Russia embraces much more than a half of its entire area, and the British Isles less than a thirtieth. According to the most recent census of its various states, the population, in 1870, amounted to 288,649,896, or nearly one-fourth of the entire human race. It is by far the most densely peopled of all the continents, having 75 persons to each sq. mile. The seven most densely peopled countries are,—Belgium, which has 440 persons to the sq. mile; the Netherlands, 275; the United Kingdom, 253; Italy, 228; South Germany, 191; North German Confederation, 188; France, 182.

4. Political Divisions.—Europe contains, at present, sixty-seven separate states, all of them more or less independent. Of this number 21 belong to the North German Confederation, now represented by Prussia, and 25 to Switzerland. Counting the confederations as forming one State each, we have in all 23 States, the names, areas, populations, and capitals of which will be found in the following table. There are 4 Empires (France, Austria, Russia, and Turkey); 37 Monarchies (including Kingdoms, Grand Duchies, Duchies, and Principalities); and 26 Republics. The various States are arranged in three separate classes, according to their political importance. Great Britain, France, Prussia, Russia, and Austria are called the five Great Powers, because they exercise a decided influence on the political affairs of Europe. Those of the second rank are Spain, Kingdom of Italy, Belgium, Sweden and Norway, and Turkey; while those of the third rank are Portugal, Switzerland, the Netherlands, Greece, Denmark, and the States of South Germany.

TABLE OF EUROPEAN STATES.

Name and Position.	Area in Eng. Square Miles.	Population according to the latest Census.	Capital.	Rivers, &c. on which the Capital stands.	Date of Census.
The British Isles, or United Kingdom, } W. of Central Europe,	122,550	31,015,234	London	Thames	1869
Portugal, in the S.W. of Europe,	36,484	4,347,441	Lisbon	Tagus	1868
Spain, E. of Portugal,	195,914	16,302,625	Madrid	Manzanares	1864
France, N.E. of Spain,	209,426	38,192,064	Paris	Seine	1866
Belgium, N. of France,	11,408	4,897,794	Brussels	Senne	1867
Netherlands, N. of Belgium,	13,631	3,628,468	Amsterdam	Amstel	1868
Denmark, N.E. of Netherlands,	54,935	1,829,696	Copenhagen	The Sound	1868
Prussia and North German Confederation, E. of Netherlands,	158,977	29,906,092	Berlin, &c.	Spree	1867
Baden, N.E. of France,	5,912	1,434,970	Carlsruhe, N.	Rhine	1867
Würtemberg, E. of Baden,	7,533	1,778,396	Stuttgart	Nesenbach	1867
Bavaria, E. of Würtemberg,	29,342	4,824,421	Munich	Isar	1867
Hesse-Darmstadt, N. of Baden,	1,683	823,138	Darmstadt	Darm	1867
Liechtenstein, S. of Würtemberg,	62	8,320	Vaduz	Rhine	1867
Austria, S.E. of Prussia,	240,351	36,000,000	Vienna	Danube	1868
Switzerland, W. of Austria,	15,716	2,510,494	Bern	Aar	1860
Kingdom of Italy, S.E. of Switzerland,	109,833	25,527,915	Florence	Arno	1868
Pontifical States, in W. of Italy,	4,588	723,121	Rome	Tiber	1868
San Marino, in E. of Italy,	24	7,308	S. Marino	Ausa	1868
Greece, S.E. of Italy,	20,152	1,348,522	Athens	Gulf of Egina	1861
Turkey, N. of Greece,	200,928	16,437,510	Constantinople	Bosphorus	1867
Russia, N.E. of Turkey,	2,110,317	68,381,742	St Petersburg	Neva	1864
Sweden, N.W. of Russia,	170,629	4,173,080	Stockholm	Lake Mælar	1868
Norway, W. of Sweden,	123,291	1,701,756	Christiania	Chris^{a}. Fiord	1865
TOTAL,	3,843,686	295,800,112			

5. **Isthmuses and Capes.**—Isthmus of Corinth, connecting the Morea with Northern Greece; Isthmus of Perekop, connecting the Crimea with the mainland of Russia. The other isthmuses, though numerous, have no distinctive names. Owing to its peninsular character, the capes and headlands of Europe are extremely numerous. The following are the principal:—

In the Arctic Ocean—C. Nordkyn, in Finmark, the most N. point of the continent; North Cape, in I. Magerŏe; C. Nord, N.W. of Iceland. *In the Baltic*—The Naze, S. of Norway; Skaw, N. of Denmark; Hango Head, S.W. of Finland. *In North Sea and Atlantic*—Sumburgh Head, S. of Shetland; Dennis Ness, N. of Orkney; Dunnet Head, Duncansby Head, and Cape Wrath, N. of Scotland; Buchanness the most E., Point of Ardnamurchan the most W., and Mull of Galloway the most S. points of Scotland; Lowestoft Ness the most E., South Foreland the most S.E., Lizard Point the most S.W., and Land's End the most W. points of England; Malin Head in the N., Fair Head in the N.E., Carnsore Point in the S.E., C. Clear in the extreme S., and Dunmore Head in the extreme W. of Ireland; Capes Gris-Nez, Barfleur, La Hague, in the English Channel; Raz Point, the extreme N.W. of France; Capes Ortegal and Finisterre, N.W. of Spain; Cabo da Roca, in Portugal, the most W. point of the continent; C. St Vincent, S.W. of Portugal; Pt. Albernos, in the Azores, the most W. point of insular Europe. *In the Mediterranean*—Punta da Tarifa, in Spain, the most S. point of the continent; Capes de Gata, Palos, St Martin, Creux, E. of Spain; Corso, N. of Corsica; Teulada, S. of Sardinia; Passaro, S.E., and S. Vito, N.W. of Sicily; Spartivento, Nau, and Leuca, S. of Italy; Matapan, S. of Greece; Matala (Crete), the most S. point of insular Europe; Chersonese, S.W. of Crimea; Abcheran, in the Caspian, the E. extremity of Mount Caucasus.

6. **Islands.**—Very numerous, and best arranged in groups or classes, according to the seas in which they are situated:—

In the Arctic Ocean—Novaia Zemlia ("new land") and Vaigatch, N.E. of Russia, and forming an insular prolongation of the Ural Mountains; Spitzbergen and the Seven Sisters, midway between Novaia Zemlia and Greenland, forming the most northern known land on the globe (lat. 80° 48′); Kolguev, at the entrance to the Gulf of Tcheskaia; Magerŏe group, fringing the N.W. coast of Finmark; Loffoden Islands, W. of Norway. *In the Atlantic*—Iceland, 700 miles W. of Norway, and immediately S. of the Polar Circle; Farŏe Isles, 35 in number, midway between Iceland and Shetland, and at the northern limit of the growth of grain; the British Isles, 5500 in number, separating the Atlantic from the North Sea (principal, Great Britain, the largest island belonging to Europe, and the seventh largest in the world; Ireland, Anglesea, Isle of Man, Hebrides or Western Islands, Orkney Islands, Shetland Islands, Isle of Wight, Scilly Islands); the Norman or Channel Isles, N. of France; the Azores, a volcanic group, 800 miles W. of Portugal. *In the Baltic*—The Danish group, between Denmark and Sweden (principal, Seeland, Fühnen, Langeland, Laaland, Falster, Alsen, Bornholm); the Swedish group, S.E. of Sweden (Gothland and Oeland); Rügen, N.W. of Prussia; the Aland Isles, at the entrance of the Gulf of Bothnia; the Livonian group (Oesel and Dago), at the mouth of the Gulf of Riga; Cronstadt or Kotlinoi, in the E. extremity of the Gulf of Finland, with a celebrated Rus-

sian fortress. *In the Mediterranean*—The Balearic Isles, east of Spain (principal, Majorca, Minorca, Iviça, and Formentera); the Sardo-Corsican group, W. of Central Italy (principal, Sardinia, Corsica, Elba); the Sicilian group, S. of Italy (principal, Sicily, Lipari Isles, Ustica, and Pantellaria); the Maltese group, or Malta, Gozo, and Comino; the Illyrian Archipelago, in the Gulf of Quarnero; the Dalmatian Archipelago, on the W. coast of Dalmatia; the Ionian Isles, W. of Greece; Eubœa or Negropont, E. of Hellas; the Cyclades, E. of the Morea; the Sporades, N. of Eubœa; Candia, S.E. of the Morea.

7. **Seas, Gulfs, and Straits.**—No other continent has so many inland seas and arms of the sea. We can enumerate only the following:—

The Mediterranean, between Europe and Africa, 2300 m. long, and 976,000 m. in area. Its principal members are, G. of Lions, G. of Genoa, the Tyrrhenian Sea, bet. Italy and the Sardo-Corsican islands; the Adriatic, bet. Italy and Turkey; Ionian Sea, bet. Greece and Italy; the Ægean Sea or Archipelago, bet. Greece and Asia Minor; Sea of Marmora, bet. European and Asiatic Turkey. *The Black Sea*, bet. Russia and Asiatic Turkey, 690 m. long by 380 m. broad, and having an area of 172,500 sq. m. Its branches are, G. of Odessa, Str. of Kherson, G. of Perekop, Sea of Azov, G. of Sivash or Putrid Sea. *The Caspian Sea*, S.E. of Russia, 700 m. long, 200 m. broad; area, 178,866 sq. m.; surface 83 feet lower than the Black Sea; drained exclusively by evaporation; probably communicated at a remote period with the Black Sea, at which time its area was vastly larger: belongs more to Asia than to Europe. *The White Sea*, an inlet of the Arctic Ocean, in the N. of Russia; area, 40,000 sq. m.: its parts are, Gulfs of Onega, Kandalak, and Arkhangel; *Tcheskaia Gulf*, N.E. of Russia; Varanger Fiord, bet. Russia and Norwegian Lapland; West Fiord, bet. Norway and Loffoden Isles. *The Baltic*, a large inland sea communicating with the North Sea, and separating Central from Northern Europe; length 900 m., br. 180 m.; area, 135,000 sq. m.; shallow throughout, sailing dangerous, tides scarcely perceptible: branches, G. of Bothnia, bet. Sweden and Finland; G. of Finland, S. of Finland; G. of Riga, bet. Livonia and Courland; G. of Dantzic, N. of Prussia; G. of Lubeck, bet. Holstein and Mecklenburg. *The North Sea* or *German Ocean*, bet. the British Isles and the continent; length from Shetland to Dover, 700 m.; greatest br., 420 m.; area, 244,000 sq. m.; traversed by immense sand-banks, as the Dogger Bank and Long Forties: branches, the Skager Rack, bet. Norway and Denmark, 60 m. broad; the Kattegat, bet. Sweden and Denmark; the Dollart and Zuyder Zee, in the N. of Holland; the English Channel, bet. England and France; the estuary of the Thames, the Wash, the Firths of Forth and Tay, the Moray and Pentland Firths. *The Irish Sea*, bet. Great Britain and Ireland; branches, North Channel, St George's Channel, Solway Firth, and Bristol Channel. *The Bay of Biscay*, N. of Spain, famous for its heavy seas and dangerous navigation.

THE PRINCIPAL STRAITS are: Str. of Gibraltar, uniting the Mediterranean with the Atlantic; Str. of Bonifacio, bet. Corsica and Sardinia; Str. of Messina, bet. Italy and Sicily; Str. of Otranto, bet. Italy and Turkey; the Hellespont or Dardanelles, uniting the Archipelago with the Sea of Marmora; the Bosporous, or Str. of Constantinople, uniting the Sea of Marmora with the Black Sea; Str. of Kertch or Yenikaleh, bet. the Black Sea and Sea of Azov; Pentland Firth, bet. Scotland and

Orkney; Str. of Dover, bet. England and France; The Sound, bet. Sweden and Seeland; Great Belt, bet. Seeland and Fühnen; Little Belt, bet. Schleswig and Fühnen.

8. **Mountain-Systems.**—Eastern Europe, or Russia, is nearly all one uniform plain, and the northern portion of Central Europe is also remarkably level; but Western and Southern Europe are highly mountainous. The various chains can be all arranged into eight grand mountain-systems—viz., the British, Hesperian, Sardo-Corsican, Alpine, Scandinavian, Sarmatian, Uralian, and Caucasian. The two last are partly European and partly Asiatic; but as their highest summits occur in this continent, and as there are no other mountains in Eastern or South-eastern Europe, they are most conveniently treated of here. These eight systems, with their widely-extended bases and ramifications, occupy the entire area of S.W. Europe.

The British System traverses the British archipelago, from the Scilly Isles to Shetland, a distance of 800 miles in length. It embraces also the Farõe group, midway between Shetland and Iceland. As compared with some of the other mountain-systems of Europe, it is of very moderate elevation, and nowhere reaches the line of perennial snow; though Ben Nevis, its culminating-point, lat. 56° 48′, probably comes short of it by less than 100 feet. The system embraces various mountain-ranges, the principal of which traverses the extreme length of the largest island, and forms the water-parting between the North Sea and the Atlantic. The mountains of Ireland and of the smaller islands are of greatly inferior elevation. We subjoin the names of the principal ranges, with the height of their loftiest mountains; and for particulars, refer the student to Scotland, England, and Ireland: *Farõe Isles*—Island of Ostero, 2864 ft.; *Shetland Isles*—Rooness, in Mainland, 1476 ft.; *Orkneys*—Hill of Hoy, 1555 ft.; *Northern Range of Scotland*—Ben Attow, 4000 ft.; *Grampians*—Ben Nevis, the highest mountain in the British Isles, 4406 ft.; *Cheviot Hills*, between Scotland and England, 2741 ft.; *Pennine Chain*, in north of England—Cross Fell, 2927 ft.; *Cumbrian Chain*, in Cumberland—Scawfell, 3229 ft.; *Cambrian Chain*, in Wales (Snowdon), 3590 ft.; *Devonian Chain*, in the S.W. of England (Caws and Beacon), 1792 ft.; *Irish Mountains*—M'Gillicuddy's Reeks, in S.W., 3404 ft. Height of snow-line in the centre of the archipelago—lat. 55°, about 5000 ft.; do. the Grampian range, about 4500 ft.

The Hesperian or Spanish System occupies the whole Spanish peninsula, the Balearic Isles, and the portion of France which lies south of the Garonne. It forms in its interior an elevated plateau of great extent, which has an average height of about 2500 feet, and embraces many lofty mountain-ranges, the principal of which are subjoined (see under "Spain"): *The Pyrenees* separate the Bay of Biscay and the Garonne basin from the basins of the Douro and Ebro, 11,168 ft.; *Cantabrian Chain*, bet. Douro and Tagus, 10,552 ft.; *Mountains of Toledo*, bet. the Tagus and Guadiana, 5110 ft.; *Sierra Morena*, bet. the Guadiana and Guadalquivir, 5550 ft.; *Balearic Mountains*, 5114 ft.; *Sierra Nevada*, bet. the Guadalquivir and the Mediterranean, 11,663 ft. Line of perpetual snow on Sierra Nevada, 11,200 ft.; do. in the Pyrenees, 8856 ft.

The Sardo-Corsican System is confined to the islands Corsica and

Sardinia, and extends in its principal chain from Cape Corso in the former to Cape Teulada in the latter. Monte Rotondo, in Corsica, 9068 ft.; Monte Genargentu, in Sardinia, 7000 ft.; snow-line in lat. 42° 30′, 9000 ft.

The Alpine System traverses France, Italy, and Turkey, and extends from the Mediterranean to the Great Central Plain, and from the Garonne to the Dniester. It embraces five distinct minor systems, all of great altitude, including the Alps proper, containing Mont Blanc in Savoy (15,781 feet), the highest summit in Europe. In reality, however, that honour should be awarded to Mount Elburz, the culminating-point of the Caucasus chain, which is 2790 feet higher than Mont Blanc, and within the limits of Europe.

(1.) The Alps proper, a huge crescent-shaped range, extending from Nice to Vienna, and bounded by the basins of the Rhone and Doubs on the west, of the Aar and Danube on the north and east, and by those of the Po and Save on the South: total length, 600 miles. It consists of two contiguous chains—viz., the Western Alps, from the Mediterranean at Nice to Mont Blanc in Savoy, dividing France from Italy, and the Rhone from the Po; and the Eastern Alps, of much greater breadth, and consisting of two series—a northern and a southern—the former including the Bernese Alps, the Alps of St Gall, and the Noric Alps, and extending nearly to Vienna; and the latter including the Pennine Alps, the Helvetian Alps, the Rhaetian Alps, the Carnic and Julian Alps. The highest summits are: *Western Alps*—Mt. Pelvoux, 13,440 ft.; *Eastern Alps*—N. Series, Finster-aar-horn, 14,100 ft.—S. Series, M. Blanc, 15,781 ft. Height of line of perennial snow in Swiss Alps, 8900 ft.

(2.) The French or Gallo-Francian Mountains, embracing all the mountains of France north of the Garonne and west of the Rhone, and connected with the Alps proper by the Jura chain (see under "France"). Mount Reculet, in Jura chain, 5632 ft.; Ballon de Guebwiller (Vosges), 4694 ft.; Cote d'Or Mts., 1968; Cevennes Mts., *M. Mezin*, 5820; Auvergne, *Puy de Sancy*, 6187.

(3.) The Apennines, 800 miles long, set out from the Maritime Alps, traverse the entire length of Italy, reappear in the island of Sicily, and form the water-parting between the Mediterranean on the one side, and the Po and Adriatic on the other. Monte Corno, in North of Naples, 9521 ft.; M. Etna, the culminating-point of the system, 10,874 ft. Height of snow-line in Sicily, 9500 ft.; height in Central Italy, 8400.

(4.) The Slavo-Hellenic Mountains comprise all the mountains in the Hellenic peninsula south of the Danube and Save, together with those of Croatia and Dalmatia. There are two principal ranges—one, the *Hellenic*, stretching southward along the E. coast of the Adriatic, and terminating at Cape Matapan in Greece; the other, the *Balkan*, branching off from the Hellenic in the N.E. of Albania, pursuing an easterly direction to Cape Emineh in the Black Sea, and forming the boundary between Roumelia and Bulgaria. *Hellenic Range*—Mt. Olympus, 9749 ft. *Balkan Range*—Mt. Tchar Dagh, 9840. Height of snow-line on Mt. Olympus, 9000.

(5.) The Hercynio-Carpathian system comprises all the mountains lying between the Danube, Dniester, Vistula, Rhine, and the Baltic, being the entire remainder of the great Alpine system. The *Carpathians*, M. Botschetje, 9528 ft.; *Riesengebirge*, between Bohemia and Moravia, 5275 ft.; *Schwartzwald*, in Baden, 4590 ft.; *Bohmerwald*, between Bohemia and Bavaria, 4613 ft.; *The Harz*, in Hanover and Prussia, 3740 ft. Height of snow-line in the Carpathians, about 6000 ft.

The Scandinavian System traverses the Scandinavian peninsula, from the Atlantic to the G. of Bothnia, and from the North Cape to the Naze. Commencing at the Naze, in the south of Norway, it proceeds northward through that kingdom as far as the latitude of Trondhjem, then forms the boundary between Norway and Sweden, and terminates at the North Cape in Lapland, after traversing a total length of about 1150 miles. In the south of Norway its breadth extends about 200 miles, but north of Trondhjem only 60 miles. The chain is not continuous, but consists rather of a series of broad plateaux, separated occasionally by deep and narrow valleys, and very rich in minerals. There are three principal ranges—the Hardanger, or Langefield, in the south, the Dovrefield in the middle, and the Kiolen Mountains in the north. Each of these has numerous glaciers: *Langefield*—Skagesloestinden, 8670 ft.; *Dovrefield*—Sneehätten, 7620 ft.; *Kiolen*—Sulitelma (lat. 67°), 6200 ft. Height of snow-line in the Langefield, 5000 ft.; Folgefonden glacier, near Bergen, 6200 ft.

The Sarmatian System is only so named by way of courtesy, as it, in fact, contains no real mountains; but being the only elevated ground between Scandinavia and the Ural Mountains, it possesses considerable hydrographical importance. The *Valdai Hills*, in the Government of Novgorod, attain an elevation of only 1100 feet, and form the water-parting between the Baltic, the Black Sea, and the Caspian.

The Uralian System forms a natural boundary between Europe and Asia, and the water-parting between the extensive basins of the Volga and the Obi. The principal chain (the Urals) extends from Orenburg, on the river Ural to the Arctic Ocean, and reappears in the lengthened insular group of Novaia Zemlia; length, 1680 miles. It consists of round-backed, plateau-shaped masses of very moderate elevation, generally not exceeding 2000 feet, but rich in gold, platinum, and other metals. The highest summits are: Konjak-Ofski (lat. 59° 55′), 5397 ft.; Obdorsk (lat. 67°), 5286 ft.

The Caucasian System extends in one immense chain from the Black Sea to the Caspian, forms the south-eastern boundary of European Russia, and separates the basins of the Kuban and Terek on the north, from those of the Kur and Rioni on the south. Length, 750 miles; mean elevation, from 8000 to 9000 feet. The culminating-point of the system, and in fact of Europe, is Mount Elburz, near the centre of the chain, 18,571 ft. above the sea, and 2790 ft. higher than Mont Blanc, the highest summit of the Alps. Mount Kazbek (long. 44° 20′), 16,523 ft. Height of line of perennial congelation, 11,000 ft.; limit of the cereals, 7000 ft.

9. **Volcanoes.**—The volcanoes of Europe, active or extinct, are very numerous. Of the former, upwards of twenty are enumerated, all of which, except Mount Vesuvius, near Naples, are situated in islands; but the latter occur more frequently in the interior of the continent, as the mountains of Auvergne in France; the Eastern Pyrenees in Catalonia; the Eifel in Prussia; the Westerwald, between Nassau and Westphalia; the Vogelsberg, between the Main and Weser; and many others in Germany.

The principal *active* volcanoes, which are for the most part confined to the basin of the Mediterranean, are: Mount Vesuvius* in

* This celebrated volcano, the only existing active one on the continent,

Naples; Mount Etna* in Sicliy; Stromboli,† Vulcano, and Vulcanello, in the Lipari Islands; Mount Hecla,‡ and several others, in Iceland; Mount Beeren in Jan Mayen, midway between Iceland and Spitzbergen; Sarytcheff in Novaia Zemlia, the most northern of known volcanoes. To volcanic agency must also be referred the Geysers, or intermittent boiling springs of Iceland. The Azores are all of volcanic origin, and contain many recently-extinct volcanoes; as also many of the Cyclades, and the N.W. of the island Sardinia. The earthquake district of Europe extends from the Caspian Sea to the Azores, the central line of concussion being more or less parallel to the Pyrenees, Alps, Carpathian and Caucasian Mountains.

10. **Plains and Table-Lands.**—Notwithstanding the highly mountainous character of Western Europe, by far the greater portion of the surface of the continent is occupied by plains and elevated plateaux or table-lands.

The most important *Plains* are: the Great Plain of Central and Eastern Europe, extending from the Str. of Dover to the Urals and Caspian, and from the Arctic Ocean to the Black Sea,—this plain has an area of 2,500,000 square miles, being about two-thirds of the entire continent; the Hungarian Plain, traversed by the Danube and Theiss, 300 miles long, and from 300 to 400 feet above the sea-level; Plain of the Lower Danube, between the Eastern Carpathians and the Balkans; Plain of Bohemia, in the basin of the Upper Elbe; Plain of Lombardy, between the Alps and Apennines, and watered by the Po. The principal *Table-lands* are: the Plateau of Central Spain, of great extent, and about 2500 feet high; the Plateaux of Langres, Orleans, and Auvergne, in Central France; the Plateau of Bavaria, about 2000 feet high; and Transylvania, embosomed in the chain of the Carpathians.

11. **Water-parting and River-Basins.**—All the rivers of Europe belong to one or other of seven great basins,—the Arctic and Atlantic Oceans, the North Sea, the Baltic, Mediterranean, Black, and Caspian Seas. The elevated ridge which separates one basin from another is called the *Water-parting*, and that which divides the seven basins into two principal groups is denominated the *Great Water-parting*.

Commencing at the south-western extremity of the continent, near the Strait of Gibraltar, the latter pursues a general N.E. direction, till it arrives at the northern termination of the Ural Mountains, thus cutting Europe diagonally into two great sections or slopes, now usually called *Watersheds*—the one inclining to the N.W., and the

buried the two cities, Herculaneum and Pompeii, with their inhabitants, during an eruption in the year 79 B.C.

* The largest and most famous volcano in Europe: sixty eruptions are recorded as having taken place during the historic period, the last in 1868.

† Constantly burning, and sometimes called, in consequence, the lighthouse of the Mediterranean.

‡ Its last great eruption (in 1845) sent the ashes as far as the Orkneys, 600 miles distant.

other to the S.E. By glancing at a map of Europe, it will be seen that all the great rivers follow one or other of these two directions.* Hence the seven basins may be reduced to *two grand basins*, one of which will include all the rivers finding their way to the Atlantic and Arctic Oceans, with their branches the North Sea, the Baltic, and the White Sea; and the other, those flowing into the Mediterranean, with its branches the Adriatic, the Black Sea, and the Caspian. For though the two last-mentioned seas are at present separated by a slight elevation, it is certain they were united during the Tertiary ages.

12. **River-Basins and Capitals.** — The following Table shows the total and direct lengths in English miles of all the principal rivers of Europe, the areas of their basins in English square miles, and the capitals of the states and provinces embraced in those basins. The rivers are arranged under the seven oceanic basins to which they respectively belong, and in the order in which their mouths would occur to an exploring expedition, which, setting out from the northern extremity of the Urals, should skirt the coast westward, southward, and then eastward, till it arrived at the western extremity of Mount Caucasus. The capitals of independent states are distinguished by SMALL CAPITALS, those of provinces by Roman letters; and when the name of the state is different from that of its capital, the former is added within parentheses.

THE RIVER-BASINS OF EUROPE.

Name of River or Estuary.	Total Length in English Miles.	Direct Length of Basin in English Miles.	Area of Basin in Square Miles.	Capitals of States and Provinces in each Basin.
1. *Basins inclined to the Arctic Ocean.*				
Petchora, . .	900	520	114,400	
Mezen, . .	400	300	30,100	
Dwina, . .	700	500	184,400	Arkhangel, Vologda.
Onega, . .	300	250	21,000	
Alten Fiord, .	150	80	..	Altengard (Finmark).

* But let us trace the Great Water-parting more exactly. Commencing, as we have said, near the Rock of Gibraltar, it follows the crest-line of the Sierra Nevada, Pyrenees, Cevennes, Côte d'Or, Vosges, and Jura Mountains; passes north of Lake Geneva to the Bernese Alps and Mount S. Gothard; sweeps round Lake Constance, which it keeps on the left, around the source of the Danube, separating its basin from that of the Rhine, Elbe, and Oder; passes between the basins of the Vistula and Dniester, and of the Düna and Dnieper, then north and east through the Valdai Hills, and around the head-waters of the Volga; pursues its course between Lakes Onega and Bielozero, turns south-east around the sources of the Northern Dwina and Petchora, whose basins it separates from that of the Volga; and then, proceeding northward along the Uralian Chain, it finally arrives at the Arctic Ocean.

Name of River or Estuary.	Total Length in English Miles.	Direct Length of Basin in English Miles.	Area of Basin in Square Miles.	Capitals of States and Provinces in each Basin.
2. Basins inclined to the Atlantic and North Sea.				
Trondhjem Fiord,	100	60	..	Trondhjem.
Torridsdals, .	120	100	..	Christiansand.
Christiania Fiord,	60	55	..	CHRISTIANIA (Norway).
Gotha, . .	400	300	17,000	Göteborg (Gothland).
3. Basins inclined to the Baltic.				
L. Mälar, . .	170	130	..	STOCKHOLM (Sweden).
Dal, . . .	250	200	..	
Angerman, .	150	120	..	Hernösand (Norrland).
Umea, . .	250	220	..	
Neva and Gulf of Finland, .	625	500	99,700	Helsingfors (Finland), Revel (Esthonia), Pskov, ST PETERSBURG (Russia), Novgorod, Petrozavodsk (Olonetz).
Düna, . .	400	300	34,7 0 0	Riga (Livonia), Vitebsk.
Niemen, . .	400	270	35,7 0 0	Grodno, Suwalki (Augustowo), Wilna.
Pregel, . .	120	120	6,300	Königsberg (Prussia Proper).
Vistula, . . .	530	360	72,300	Plock, Warsaw (Poland), Radom, Lemberg (Galicia), Lublin.
Oder, . .	445	360	45,200	Stettin (Pomerania), Breslau (Prussian Silesia), Posen (Prussian Poland), Troppau (Austrian Silesia).
Stör, . .	95	55	..	SCHWERIN (Mecklenburg-Schwerin).
Trave, . .	50	40	..	LUBECK.
Schleifiord, .	25	20	..	Schleswig.
4. Basins inclined to North Sea.				
Lymfiord, .	100	90	500	Aalborg (Jutland).
Elbe, . .	550	420	55,000	Gluckstadt (Holstein), HAMBURG, Magdeburg (Prussian Saxony), DESSAU (Anhalt), DRESDEN (Saxony), NEU-STRELITZ (Mecklenburg-Strelitz), BERLIN (Prussia), RUDOLSTADT (Schwartzburg Rudolstadt), GREITZ (Reuss Greitz), ALTENBURG (Saxe-Alt.), SONDERSHAUSEN (Schwarzburg-Sonder.), GOTHA (Saxe-Coburg-Gotha), WEIMAR (Saxe-Weimar), Prague (Bohemia).
Weser, . .	230	250	17,700	BREMEN, BUCKEBURG (Schaumburg-Lippe), MEININGEN (Saxe-Mein.), OLDENBURG (Hanover), BRUNSWICK, DETMOLD (Lippe-Det.), AROLSEN (Waldeck, Cassel (Hesse-Cassel).

Name of River or Estuary.	Total Length in English Miles.	Direct Length of Basin in English Miles.	Area of Basin in Square Miles.	Capitals of States and Provinces in each Basin.
Basins inclined to North Sea (continued).				
Ems, . .	160	130	..	Münster (Westphalia).
Hunse, . .	50	40	..	Gröningen, Assen (Drenthe).
Vecht, . .	90	60	..	Zwoll (Overyssel).
Rhine, . .	600	400	75,000	AMSTERDAM (Netherlands), Utrecht, Arnhem (Guelderland), Cologne (Rhenish Prussia), Wiesbaden (Nassau), CARLSRUHE (Baden), Strasbourg(1) (Alsace), VADUZ (Liechtenstein), Nancy (Lorraine), DARMSTADT (Hesse-Darm.), STUTTGART (Würtemberg), BERN (Switzerland). (2)
Meuse, . .	580	230	..	Bois-le-duc (N. Brabant), Maestricht (Dutch Limburg), Liege, Namur, Arlon (Belgian Luxemburg).
Scheldt, . .	210	120	..	Middelburg (Zealand), Antwerp, Bruges (W. Flanders), Ghent (E. Flanders), BRUSSELS (Belgium), Hasselt (Belgian Limburg), Lille (French Flanders), Arras (Artois), Mons (Hainault).
Basins inclined to the Atlantic (No. 2 continued).				
Somme, . .	115	90	..	Amiens (Picardy).
Seine, . .	414	250	28,500	Rouen (Normandy), PARIS (France), Troyes (Champagne).
Vilaine, . .	125	80	..	Rennes (Bretagne).
Loire, . .	530	350	44,500	Angers (Anjou), Tours (Touraine), Orleans (Orleannais), Nevers (Nivernais), Le Mans (Maine), Limoges (Limousin), Gueret (La Marche), Poitiers (Poitou), Bourges (Berry), Moulins (Bourbonnais), Clermont (Auvergne).
Charente, .	200	110	..	Rochelle (Aunis), Saintes (Saintonge), Angoulême (Angoumois).
Garonne, . .	300	230	81,000	Bordeaux (Guienne), Toulouse (Languedoc), Auch (Gascogne), Foix (Foix).

(1) For the sake of brevity, the old provinces of France and Spain are those here employed, but the new divisions will be found in the corresponding tables under those countries.
(2) The capitals of the Swiss cantons will be found in the River-System of Central Europe.—(See under "Austria.")

Name of River or Estuary.	Total Length in English Miles.	Direct Length of Basin in English Miles.	Area of Basin in Square Miles.	Capitals of States and Provinces in each Basin.
Basins inclined to the Atlantic (No. 2 continued).				
Adour,	95	90	..	Pau (Béarn).
Nervion,	45	30	..	Bilbao (Basque Provinces).
Nalon,	62	50	..	Oviedo (Asturias).
Ulla,	64	50	..	Santiago (Galicia).
Minho,	220	150	14,700	
Ria d'Este,	65	50	..	Braga (Minho).
Douro,	450	340	34,200	Oporto (Douro), Braganza (Tras-os-Montes), Leon, Burgos (Old Castile).
Mondego,	180	90	..	Coimbra (Beira).
Tagus,	540	450	33,000	Lisbon (Portugal), Madrid (Spain).
Sado,	100	70	..	Evora (Alentejo).
Guadiana,	400	320	25,000	Badajos (Sp. Estremadura).
Guadalquivir,	300	270	19,500	Seville (Andalucia), Granada.
5.—Basins inclined to the Mediterranean.				
Segura,	180	120	..	Murcia.
Guadalaviar,	130	100	..	Valencia.
Ebro,	340	280	32,900	Zaragoza (Arragon), Pamplona (Navarre).
Llobregat,	75	70	..	Perpignan (Rousillon).
Rhone,	645	340	37,900	Avignon, Lyon (Lyonnais), Grenoble (Dauphiné), Besançon (Franche (Comté), Dijon (Bourgogne), Chambery (Savoy).
Arno,	90	75	..	Florence (K. of Italy).
Tiber,	185	130	..	Rome (Pontifical States).
Po,	450	280	34,600	Turin (Piedmont), Modena, Parma, Venice (Venetia), Milan (Lombardy).
Narenta,	140	70	..	Mostar (Herzegovina).
Bojana,	80	65	..	Scutari (Albania).
Salembria,	110	65	..	Larissa (Thessaly).
Vardar,	170	125	..	Salonika.
Maritza,	260	160	18,200	
6.—Basins inclined to the Black Sea.				
Danube,	1795	980	306,000	Silistria (Bulgaria), Belgrade (Servia), Peterwardein (Military Frontier), Buda (Hungary), Vienna (Austria), Linz (Upper Austria), Jassy (Moldavia), Czernowitz (Buckowina, Bucharest (Wallachia), Agram (Croatia), Bosna-Serai (Bosnia), Laybach (Illyria), Klausenburg (Transylvania), Eszek (Scla-

Name of River or Estuary.	Total Length in English Miles.	Direct Length of Basin in English Miles.	Area of Basin in Square Miles.	Capitals of States and Provinces in each Basin.
Basins inclined to the Black Sea (continued).				
Danube (*cont.*)				vonia), Grätz (Styria), Brünn (Moravia), Innsbrück (Tyrol), MUNICH (Bavaria), Salzburg, Temeswar (Banat and Servia).
Dniester, . .	500	400	27,300	Kamienetz (Podolia), Kichenev (Bessarabia).
Dnieper and Bug,	..	640	195,500	Kherson, Ekaterinoslav, Kiev, Mogilev Smolensk, Poltava, Tchernigov, Kourak, Jitomir (Volhynia), Minsk.
Don, . .	995	500	176,500	Tcherkask (Don Cossacks), Stavropol, Kharkov, Veronej.
Kuban, . .	380	280	..	Ekaterinodar (Black Sea Cossacks).
7.—*Basins inclined to the Caspian.*				
Volga, . .	2400	1080	527,000	Astrakhan, Saratov, Samara, Simbirsk, Kasan, Nijni-Novgorod, Kostroma, Jaroslav, Tver, Perm, Viatka, Penza, Riazan, Kaluga, Orel, Vladimir, Tambov, Moscow, Tula.
Ural, . .	1800	550	85,000	Orenburg.
Kur, . .	520	400	80,800	Teflis, Erivan, Shemakha (*all in Transcaucasia*).

13. **Lakes.**—Lakes being for the most part mere expansions of the rivers that drain them, the most natural way of treating them is to group them in the order of the river-basins to which they belong.

Clyde Basin—Loch Lomond, the largest lake in Scotland, drained by the Leven; area, 45 sq. m. *Leven*—Windermere, largest lake in England, 10 m. long; area, about 5 sq. m. *Dee*—Lake Bala, the largest in Wales, 4 m. long. *Bann*—Lough Neagh, in Ireland, the largest in the British Isles; area, 153 sq. m. *Dwina*—Kubinsköe, in Vologda, North Russia, drained by the Sukhona. *Onega*—Lakes Latcha and Voje, in Olonetz. *Vygh*—Vigo and Sego, in Olonetz. *Kem*—Kunto and Niuk, in W. of Arkhangel. *Kovdo*—Kovdo, Piavo, and Imandra, in Arkhangel. *Varanger Fiord*—Enara, drained by the Patajoki or Pasvig, in N. of Finland. *Glommen*—Lake Miösen, in S.E. of Norway. *Gotha*—Wener, in S.W. of Sweden, 2020 sq. m.; and Faemund, in E. of Norway, drained by the Clara. *Motala*—Wetter, E. of Lake Wener. *Arboga*—Mälar and Hielmar, in

the E. of Sweden. *Dal*—Siljan, in the centre of Sweden. *Indals*—Storsion, N. of Lake Siljan. *Skeleftea*—Stör and Horn, united, in N. of Sweden. *Lulea*—Stora-Lulea, in N. of Sweden. *Tornea*—Tornea, in N.W. of Sweden. *Ulea*—Ulea, in the centre of Finland. *Borgo A*—Pajani, in the S. of Finland. *Neva*—Ladoga (the largest in Europe, area, 7150 sq. m.), Saima, Orivesi, Pielis, Kuopio or Kalavesi, Ilmen, Onega, Voldozero, all in Finland and Olonetz. *Narova*—Peïpus, or Tchoudskoé, between Livonia and St Petersburg. *Pregel*—Maner See, in East Prussia. *Vistula*—Spirding See, in East Prussia, drained by the Pische, an affluent of the Narew. *Stör*—Schwerin, in Mecklenburg-Schwerin. *Elbe*—Müritz, in Mecklenburg-Strelitz, drained by the Havel. *Rhine*—Boden See, on the Rhine; Thun and Brienz, on the Aar; Zurich and Wallenstadt, on the Limmat; Lucerne and Zug, on the Reuss; Bienne and Neuchâtel, on the Thiele: all in Switzerland. *Rhone*—Leman or Geneva, bet. Switzerland and Savoy; Annecy, in Savoy, *Po*—Garda, drained by the Mincio; Como, by the Adda; Maggiore and Lugano, by the Ticino. *Danube*—Balaton or Platten See, drained by the Sio; and Neusiedl, by the Raabnitz: both in Hungary. *Don*—Manytch, in Caucasus, drained by the Manytch. *Volga*—Seligher, in Russia, near the Valdai Hills, forming the source of the Volga.

14. **Climate.**—The climate of Europe is greatly milder than in other continents under the same latitude; but it presents striking diversities in different parts, arising mainly from the following causes:—

1st, *Its Position relative to the Atlantic.*—The prevailing winds are from the W. and S.W., and hence pass over that ocean before arriving here; acquire its temperature; become laden with its moisture; and, striking the shores of the continent, powerfully affect the climate of Western Europe. 2d, This effect is greatly increased by the warm ocean-current called *The Gulf Stream*, which, setting out from the Gulf of Mexico, at a very high temperature, proceeds along the coast of North America, crosses the Atlantic in a N.E. direction, arrives at the western shores of Europe, and imparts to them a temperature and climate greatly milder than they would otherwise possess. 3d, The *Elevation* of the land above the sea-level. 4th, The *Direction* of the slope, as indicated by the Great Water-parting of Europe (described at p. 72). 5th, The *Situation* of the several countries in regard to great mountain-chains in their vicinity. 6th, The *Latitude* of the place, or its distance from the equator. 7th, *Proximity to other peculiar Climatic Regions.*—For example, the south of Europe is considerably affected by the proximity of Africa, which renders its summer climate oppressive; while Northern Europe is continually exposed to the chilling winds of the Polar Seas and of Siberia.

Climatic Zones.—If the Northern Hemisphere be divided into six *Isothermal Zones* (viz., the Equatorial, Warm, Mild, Cool, Cold, and Polar Zones), which, as regards climate, are greatly more important

than *zones of latitude*, it will be found that no part of Europe lies within either of the *extreme* zones, that is, the Equatorial and Polar.

THE WARM ZONE, which is bounded by the isotherms of 77° and 59° Fahr., and whose average annual temperature is 68°, includes nearly all the Spanish peninsula, the islands of Corsica, Sardinia, Sicily, Malta, and Crete, all Greece, and Italy south of Rome. THE MILD ZONE, between the isotherms of 59° and 41°, and with an average annual temperature of 50° Fahr., comprises all Central Europe (including France and the British Isles), the Faröe Isles, Scandinavia and Russia south of a line drawn through Bergen, Christiania, Stockholm, Riga, Moscow, and Orenburg. THE COOL ZONE, between the isotherms of 41° and 32°, and with an average annual temperature of 36° Fahr., includes nearly all Iceland, together with a broad belt of the continent lying between the Mild Zone and a line passing through Hammerfest, the mouth of the river Tornea, Arkhangel, and Tobolsk in Siberia. THE COLD ZONE embraces all the remainder of the continent together with Spitzbergen, is bounded by the isothermal curves of 32° and 5°, and enjoys a mean annual temperature of 18° Fahr.

Rain.—The Quantity of Rain varies greatly in the different countries, but most of the variations can be traced to known laws:—

(1.) It decreases as we proceed from S. to N. At the equator, 96 inches fall in the year; in Italy, 45; England, 37; in North Germany, 22½; and at St Petersburg, 16 inches.

(2.) It decreases as we proceed from the shores of the Atlantic eastward. On the coast of Portugal, the amount is 111 inches; on the west of Ireland, 47 inches; but at London, 24 inches; Paris, 21 inches; Eastern Europe, 15 inches.

(3.) In Western Europe, and as far E. as Moscow, the rain-winds are from the S.W.; but farther E. and N. they come from the contrary direction.

(4.) In the Warm Zone it rains most in winter; in the Mild Zone, south of the Alps and Carpathians, most in autumn; in all the remainder of Europe, most in summer.

(5.) The number of rainy days decreases as we proceed from the west to the east side of the continent: thus, in Ireland (east side), rain falls on 208 days; Netherlands, 170 days; west of Scotland (Cape Wrath), 250 days; east of Scotland (Edinburgh), 165 days; whereas in the north of Germany and Gulf of Finland, it falls on 152 days; Poland, 158 days; basin of the Volga, 90 days; in the interior of Siberia, 60 days.

(6.) The number of days on which snow falls increases from south to north: thus, at Palermo, in Sicily, on 1 day; Rome and Florence, 2; Venice, 5; Milan, 10; Paris, 12; Copenhagen, 30; St Petersburg, 171 days. At Gibraltar snow is rare, and Malta is never visited by snowflakes.

The average amount of rain over all Europe is 34 inches. The rainiest localities in Europe are, Coimbra, in the valley of the Mondego, where the extraordinary amount of 118 inches falls annually; the Alps; Bretagne; Cornwall; the south of Ireland; and the north-west corner of Scotland. In regard to the *variation* from the true north of the *magnetic needle*, the whole continent, except a small part of Russia, has a W. declination, at present—while in Asia it is E.

15. **Geology.**—The following condensed epitome of the geology of Europe has been carefully prepared from the "Geological Map of Europe," edited by Sir Roderick I. Murchison and Professor Nicol, and forming Plate IV. of the new edition of Johnston's 'Physical Atlas.' *

Crystalline Strata, or Metamorphic Rocks, prevail especially in North-western Europe, where they cover the whole surface of Scandinavia and Finland, with the exception of two extensive tracts in the centre and north of Norway. The other principal localities are Scotland, N. of the Grampians; the N. and N.W. of Ireland; the centre and W. of France; Bohemia; Transylvania; the E. side of Turkey, Greece, Corsica, and Sardinia; and the great mountain-ranges of the Continent, especially the Alps, Mount Caucasus, and the Urals. Wherever crystalline strata greatly abound, they are penetrated through by GRANITIC ROCKS; as in Portugal and Galicia, Bretagne, the Grampians, the Loffoden Isles, Bohemia, basin of the Dnieper and Bug, Corsica, Sardinia, &c. TRAP ROCKS chiefly abound in Iceland, the Faröe Isles, Sky and Mull, County Antrim, Wales, Sweden, Finland, the Urals, and Lombardy; and VOLCANIC ROCKS in Naples, the Pontifical States, Sicily, Sardinia, Central France, and the Carpathians.

Lower Palæozoic Strata—containing the petrified remains of the earliest plants and animals yet discovered—occupy the two large tracts in Norway above referred to; an extensive belt S. of the G. of Finland, and a tract in the extreme S. of Sweden; the S. of Scotland, Westmoreland, nearly all Wales, and the W. of Ireland; Bretagne; large areas in Southern and Central Spain; the Julian and Carnic Alps; some parts of Bohemia; and a very long, narrow belt in the Urals, extending from the river Ural to the Arctic Ocean.

Upper Palæozoic Strata—embracing the Devonian, Carboniferous, and Permian systems—have their largest development in Russia, where they extend, without a break, from the Baltic to the Urals, and from the Arctic Ocean to Voronej, in the centre of the Don basin, and occupy another large tract in the basin of the Donetz, an affluent of the Don: they thus cover nearly a half of all Russia, but contain no coal, save along the Donetz, where mines are wrought to a considerable extent. The next most important tract occupied by this series is in the basins of the Rhine, Moselle, and Meuse, within the kingdoms of Prussia and Belgium. They are very extensively developed in the British Isles, especially in Ireland, where they cover four-fifths of the country; and in the larger island extend in a broad belt from the Firth of Forth to Devonshire (a tract which is extremely rich in the valuable minerals, coal and ironstone), and line the coast from Aberdeenshire to Caithness, extending to the Orkney Islands.

The **Secondary Series**, or *Mesozoic Group*, immediately overlies the

* For the Palæontology of the different geologic systems and formations, we refer the student to pages 41-52 above.

Palæozoic, but differs from it widely in the character of its fossils. It embraces the Triassic, Oolitic, and Cretaceous systems, and occupies a very large portion of the surface of Europe S. of lat. 55°; but rarely occurs N. of that parallel, except in three detached tracts in the N.E. of Russia (in the basins of the Petchora and Vychegda). In the S. of Russia it occupies extensive areas in the basins of the Ural, Volga, and Don, as well as of the Pripet and Desna, affluents of the Dnieper. In Turkey and Greece it occupies the greater part of the territory S. of the Danube and Save, and the island Candia; Southern Italy and Sicily; in Spain, a broad belt commencing at Gibraltar, and extending first N.E. and then N. to the Bay of Biscay; the W. of Portugal; the greater part of France E. of Bretagne and N. of the Gironde; nearly all Germany, from Hanover to the Danube; and more than a half of England, especially the E., centre, and S. Secondary strata also cover the Northern Carpathians, and large portions of the Alps and Pyrenees.

The **Tertiary Series**, like the Secondary, prevails almost exclusively to the S. of lat. 55°, while the Palæozoic and Crystalline strata are found chiefly in the N. of Europe. Tertiary strata extend, with few interruptions, in a broad zone, which, beginning at the North Sea and Baltic, proceeds in a S.E. direction to the Black Sea and Caspian, and extends in breadth from the Niemen to the Carpathians. In Asia they cover the immense basin of the Obi, and the equally large continental or internal basin of the Caspian. To the W. and S. of the great belt above referred to, they cover, in whole or in part, the basins of all the great rivers, as the Danube, Po, Ebro, Tagus, Garonne, Seine, and Thames—the last two including the celebrated Paris and London basins. The other localities where the Tertiaries prevail must be learned by inspecting a good geological map, as no description can convey an accurate impression of their actual position and extent. Such inspection cannot fail to result in the conviction, that Central and Southern Europe remained submerged under the ocean for many ages after the northern portion existed as dry land, and that during those ages the Black Sea and Caspian were united.

16. **Minerals.**—The mineral treasures of Europe are of the highest importance, not so much on account of the precious metals—in which it is inferior to other continents—as for the abundance and utility of its more common minerals. Our limits will only allow us to specify the principal localities where the most important minerals occur.

Metals.—*Gold* is chiefly found in the Ural and Carpathian Mountains (where more gold is obtained than in all the rest of Europe), especially at Kremnitz in Hungary, and in the Russian governments of Perm and Orenburg, where the mines yield 72,000 lb. annually. Other localities are, Transylvania, Salzburg, Piedmont, Ireland, and the sands of the Danube, Rhine, Rhone, Garonne, Tagus, and other rivers. *Mercury*, chiefly at Almaden in Spain, and at Idria in Carniola. *Silver*—British Isles (Cornwall, &c.), Germany, Hungary,

Norway, Bohemia, Transylvania, Turkey. *Copper*—Cornwall, Devonshire, Anglesea, Cork, Waterford, Ural Mountains, Hungary, Styria, Norway, Prussia, Andalucia, Pyrenees, and Chessy, near Lyon. *Tin*—Cornwall, Devonshire, Saxony, Bohemia. *Lead*—Leadhills in Scotland, Cornwall, the Sierra Nevada, the Eastern Alps, Saxony, and Bohemia. *Zinc*—Nowhere plentiful, but chiefly found in the Riesengebirge. *Cobalt*—In Germany, almost exclusively. *Antimony and Bismuth*—Rare, but chiefly in Germany. *Arsenic*—Schemnitz, in the Carpathians. *Iron*—Widely distributed, and generally wherever the coal-measures are found; but most abundant in Great Britain, the Cevennes, Vosges, Jura, Eastern Alps, Mountains of Norway, the Riesengebirge.

Precious Stones.—Diamonds in the government of Perm; jasper, chalcedony, agate, and garnets, in Scotland and Germany; topaz in the Urals, Scotland, England, Bohemia, and Saxony; the opal in Hungary; rubies in France.

Inflammable Minerals.—*Coal*—Generally wherever the Upper Palæozoic strata are found, especially in England, the S. of Scotland, Ireland, Belgium and N. of France, Germany, Prussia, Austria, S. of Russia. *Sulphur*—In volcanic regions, as the Solfataras of Naples, Sicily, Iceland. *Amber*—On the Prussian shores of the Baltic. *Petroleum*—In Wales, Italy, and Wallachia.

Mineral Salts.—*Common Salt*—In England, Germany, Hungary, Poland, Spain, Moldavia. *Brine Springs* very numerous in localities where Secondary strata prevail; Epsom Salts at Epsom in England; Borax in Hungary; Saltpetre in Spain, Naples, Hungary, and Russia; Alum in the crystalline rocks of Sweden, Norway, Britain, and in the volcanic formations of Sicily, Lipari Islands, and the Azores.

17. **Botany.**—The flora of Europe does not probably contain a single indigenous plant peculiar to itself. This striking fact is sufficiently accounted for by its geographical position; for not only is it in close proximity to Northern Africa, but the entire continent is a mere prolongation of Western Asia. Of the twenty-five Phyto-geographic Regions into which Schouw divides the vegetation of the globe (*see* p. 54), Europe embraces a portion of the first three—viz., the Arctic-Alpine, the North European, and the Mediterranean Regions.

The **Arctic-Alpine Region**, which is also called the region of *Mosses and Saxifrages*, naturally divides itself into two provinces—the Polar and Alpine; the first embracing the north polar lands of Europe, Asia, and America, between the limits of ice and the region of trees; and the second, all the higher elevations of Europe and Asia south of the polar circle, which extend from the line of perpetual congelation to the first appearance of trees. Both provinces are characterised by a profusion of lichens, mosses, and saxifrages; by the total absence of trees properly so called, though numerous shrubs, especially the willow and dwarf-birch, make their appearance in the Polar province, and junipers, alders, willows, rhododendrons, whortleberries,

and cranberries, in the Alpine. Dwarf perennial herbs, with large flowers of bright colours, are also abundant; but annual plants are rare, and tropical families are wholly wanting. The mean annual temperature of the polar provinces, which corresponds with the Cold Zone (described at p. 78), is 18° Fahr., and hence cultivation is impossible.

The **North European Region**, also called the region of the *Umbelliferæ* (mean temp. 29°—46° Fahr.), embraces the wide space between the Arctic Circle and lat. 45°—or the Mild and Cool Zones described above—being the whole of Europe and Asia N. of the Pyrenees, Alps, Black Sea, Caucasus, and Altai Mountains, not included in the former region. It is characterised by the prevalence of the natural orders Umbelliferæ, Cruciferæ, Gramineæ, Caricæ, Fungi, and Cichoraceæ. The predominant trees are the Coniferæ and Amentaceæ (or the cone-bearing and catkin-bearing families), as the fir, yew, and cypress, willow, poplar, hazel, birch, plane, alder, oak, and beech; the pastures are luxuriant, and the forest trees lose their foliage in winter.

The **Mediterranean Region**, or region of the *Labiatæ and Caryophylleæ* (mean temp. 55°—73° Fahr.), embraces all the remainder of Europe, together with Asia Minor, Syria, Africa N. of the Sahara, the Azores, and Canaries. It is specially marked by the predominance of the orders Labiatæ and Caryophyllæ; by some representatives of tropical climes, as palms, terebinths, and laurels; by many evergreen trees and shrubs; by the families of the second region becoming less numerous, their place being occupied by a greater number of woody plants; and by the existence of a winter flora. The pastures, however, are less luxuriant than in the former region, and are interspersed with copses of the heath tribe.

Food-Plants.—Among Food-Plants the *cereals* are cultivated 20° farther N. in Europe than in America; their northern limit being nearly coincident with that of the Cool Zone described under the article CLIMATE. Seven distinct species are cultivated, each of which requires a climate peculiar to itself; but the zones of territory occupied by them merge into one another like the seven colours of the rainbow, and, like the latter, preserve the same invariable sequence. Beginning at the N., the order is as follows:—Barley, rye, oats, wheat, millet, maize, and rice; the four last of which extend southward to the tropical regions. No species of grain can be brought to maturity in Iceland; but barley grows in the Faröe Isles, and on the continent as far N. as Hammerfest and the mouth of the White Sea. Rye is largely cultivated in the N. of Europe, especially in Russia, Germany, and part of France, where it forms the principal food of the people; and it is estimated that it sustains one-third of the population of Europe. Oats are extensively grown in Scotland, Norway, Sweden, Russia, and other places between the lat. of Paris and 65° N. Wheat extends over a very wide area—from lat. 64° in Norway to the tropic of Capricorn; in Great Britain it is grown with advantage as far north as the Moray Firth; millet is raised in Bretagne, Tuscany, and a few other localities S. of lat. 45°; maize in Eastern and Southern Europe, especially Hungary, Spain, and N. Italy. Few European countries afford the requisite heat and moisture for the successful

cultivation of rice; but it is grown in Spain, Greece, and Italy. Of *other food-plants* grown in Europe, the principal are the potato, cabbage, turnip, buckwheat, the sweet potato, and the various leguminous plants, as pease, beans, lentils, and carobs or St John's bread. The potato can be raised at a considerably higher latitude than any of the cereals, and it forms the highly-relished food of millions of the people from Iceland to Greece. *Fruit Trees* are numerous, especially to the S. of the Alps and Pyrenees. The vine extends N. to lat 50°—53°, but the best wines are produced between 30° and 45°. Farther north its place is in a great measure supplied by the various kinds of orchard fruits, as apples, pears, cherries, plums, and walnuts; and in still higher latitudes by the gooseberry, currant, rasp, and strawberry, and by malt liquors. The principal fruit-trees—figs, almonds, pomegranates, olives, lemons, oranges, peaches, apricots, mulberries, citrons, stone-pines, and date palms—are confined to the Warm Zone (p. 78).

18. **Zoology.**—The Fauna of the globe is usually classified into six zoological kingdoms, and subdivided into fourteen provinces, of which one kingdom, including three provinces, embraces all the animals belonging to this continent. The three provinces referred to are the *Northern, Middle, and Southern*, the respective limits of which harmonise pretty closely with those of the three botanical regions described at p. 81. The Isotherm of 41° divides the northern from the central province, and the latter is separated from the southern by the Pyrenees and Alps.

The following table presents a synopsis of the Fauna of Europe as presently known—its Mammals, Birds and Reptiles—the first column showing the name of the order; the second, the total number of species; the third, the total European species; the fourth, fifth, and sixth, the numbers found in the Northern, Central, and Southern provinces respectively.

ORDERS.	Total Number of Species.	Total European Spec.	N.	C.	S.
EUROPEAN MAMMALS.					
Quadrumana (Four-handed), . . .	202	1	...	...	1
Carnivora (Flesh-eating), . . .	528	119	41	46	42
Marsupialia (Pouched Animals), . .	123	...	...	...	...
Rodentia (Gnawing Animals), . . .	604	61	16	22	16
Edentata (Toothless Animals), . .	28	...	...	...	...
Pachydermata (Thick-skinned), . .	39	1	...	1	1
Ruminantia (Ruminating), . . .	180	17	4	9	9
Cetacea (Ocean-living), ...	75	24	...	...	...
Total number of Species, . .	1779	223	61	78	69

ORDERS.	Total Number of Species.	Total European Spec.	N.	C.	S.
EUROPEAN BIRDS.					
Rapaces (Birds of Prey), ...	...	54	28	37	41
Scansores (Climbers), ...	...	23	12	14	21
Oscines (Songsters), ...	...	186	70	123	120
Gallinaceæ (Gallinaceous Birds), . .	...	28	6	21	21
Grallatores (Waders), ...	...	87	32	57	54
Natatores (Swimmers), ...	...	112	64	54	37
Total number of Species, . .	6226	490	212	305	294
EUROPEAN REPTILES.					
Testudines (Tortoises), ...	69	6	...	2	5
Sauria (Lizards), ...	203	29	2	12	20
Ophidia (Serpents), ...	265	15	3	8	15
Batrachia (Frogs), ...	120	23	5	9	11
Total number of Species, . .	657	73	10	31	51

Mammals.—It will be seen from the above that while the entire number of European MAMMALS is comparatively small, two orders—the *Pouched* and *Toothless*—are entirely absent; while other two—the *Four-handed* and *Thick-skinned*—are each represented by one solitary species—viz., the Barbary Ape, a Quadrumanous animal inhabiting the rock of Gibraltar, and the wild boar, a denizen of Central and Southern Europe. Of the remaining orders, that of the *Carnivora* is by far the most important, not merely on account of the great number of species it contains, but also because most of them are hostile to man, and have in all ages been the objects of his pursuit,—either on account of the dangers to which they subject him, or the commercial value of their skins and other products. The order is represented in Europe by five families, the names and principal species of which are the following:—The Cheiroptera or bat family, including the common, the horse-shoe, and the bull-dog bat; the Insectivora, or hedgehogs, shrews, desmans, and moles; the Plantigrada, or bears, badgers, and gluttons; the Digitigrada, or polecat, ermine, weasel, and beech-marten, dog, wolf, fox, jackal, and civet, the lynx, and wildcat (the lion and tiger are nowhere found in Europe); the Pinnipedia or Amphibia, or the otter, common seal, and walrus. The *Rodentia* embrace the squirrel, beaver, rat, mouse, dormouse, hamster, mole, water-rat, vole, and lemming, porcupine, hare, rabbit, and the pigmy lagomys. The *Ruminantia* are represented by the camel, deer, reindeer, elk, antelope, rock-goat, wild sheep, and buffalo. The *Cetacea* include the common Greenland whale, the great northern rorqual, the spermaceti whale, narwhal, sea-unicorn, porpoise, and common grampus.

Birds.—Europe contains a greater number of birds than any other zoological kingdom, with the exception of Tropical America. The fol-

lowing are the principal species in each of the six orders: *Birds of Prey* comprise vultures, hawks, and owls. *Climbers* include swifts, goatsuckers, cuckoos, woodpeckers, kingfishers, and hoopoes. *Songsters*—the nightingale, blackbird, thrush, linnet, and goldfinch. *Gallinaceous Birds*—the pigeon, capercailzie, red-grouse (the only species of bird peculiar to the British Isles), ptarmigan, partridge, and pheasant. *Wading Birds*—storks, herons, snipes, plovers, cranes, rails, bustards, runners, and flamingoes. *Swimmers*—the duck, swan, goose, grebe, loon, auk, and tern.

Reptiles.—European reptiles are all of insignificant size as compared with the gigantic crocodiles, alligators, and boas of the other zoological provinces. Only six species of *Tortoise* are found, and these are nearly confined to the islands of the Mediterranean; but the marsh tortoise is found as far N. as the middle of Germany, the leathery tortoise on both sides of the English Channel, and the hawk's-bill turtle, according to Dr Fleming, in Shetland. The *Lizards* comprise the chameleon, gecko, iguana, true lizard, and skink—the last two of which are found in the British Isles. *Serpents* are very few in number, and include only two venomous species, both of which belong to the genus viper. All the really formidable species are unknown in this continent. There are twenty-three species of *Frogs*, of which eight are found in the British Isles. They are found in higher latitudes than any other order of reptiles, extending as far north as the head of the Gulf of Bothnia. The European species comprise true frogs, tritons, and newts.

19. **Ethnography.**—I. RACES.—The people of Europe belong to two distinct Races—the Caucasian and the Mongolian.

The **Caucasian Race**, which is by far the most numerous, derives its name from the region of the Caucasus and Armenia, the ancient centre from which all the existing varieties of men have sprung. This region is situated in the centre of the Old World, and in the North Temperate Zone; is surrounded by the Black Sea, the Caspian, the Red Sea, and Mediterranean; is connected by its noble rivers with the Persian Gulf and Indian Ocean; enjoys a climate of rare salubrity, a soil of great richness, and a vegetation of almost unrivalled luxuriance. Its inhabitants have ever constituted the highest type of humanity, and near it were located all the most illustrious nations of ancient and modern times. The Caucasian race now extends from Iceland and the Atlantic to the Ganges and Brahmaputra, and from the Arctic Circle to the Tropic of Cancer: it embraces Europe, South-Western Asia, and the North of Africa, and comprehends the greater part of the posterity of Japheth and Shem.

The **Mongolian Race** consists of the remaining tribes of the two great families now mentioned: they people all the remainder of Asia, together with certain isolated localities of Europe, which they entered at a much later period, and generally in the character of wandering hordes. The following are the principal Mongolian tribes that belong to this continent:—The FINNS (including the Finns Proper, Lapps, Quänians, Esthonians, Woguls, Permians, Tchuwasches, Mordwins, and Tcheremesses), extending from the Ural Mountains to the Gulf of Bothnia and the river Niemen; the SAMOIEDES between the White Sea and the river Kara: the MAGYARS or

Hungarians, in Hungary, allied in form and language to the Finns; the TARTARS, inhabiting the region north of the Black Sea and river Kuban; the KALMUCKS, N. of Mount Caucasus, and between the mouths of the Volga and Don; and the TURKS, in Rumelia, who form a connecting-link between the Mongolian and Caucasian races, more closely allied to the Tartar branch in appearance, but to the Caucasians in language.

II. LANGUAGES.—All the languages presently spoken in Europe belong to two great families—the Indo-European and Finno-Tartarian. Nations belonging to the Caucasian race speak the former, those of Mongolian origin the latter. The Indo-European tongues spoken in Europe are subdivided into four groups or classes—viz., the Celtic in the W.; the Teutonic, in the N. and N.W.; the Greco-Latin, in the S.; and the Sclavonic, in the centre and E. All these, together with the remaining branches of the Indo-European family presently spoken in Asia, are derived from the Sanscrit, an ancient, copious, and highly-refined language, spoken at a very remote period by a Japhetic nation who invaded India from the north-west, driving the original inhabitants either to the extreme south of the peninsula, or to the mountain-fastnesses of the interior, where they continue to speak their original barbarous tongues. The original seat of these invaders has not been definitely ascertained; but a kindred tribe, who spoke the closely-allied Zend language, were the earliest inhabitants of Bactria (*Persia*); and both were probably nearly allied to the ancestors of the Celts, Teutons, Sclaves, and Hellenes, who, before the dawn of history, penetrated into Europe in separate bodies and at diverse times—thus originating the four groups of languages above enumerated. All these languages are polysyllabic, highly inflexional, systematically refined, copious in their vocabulary, phonetic (not ideographic) when written, are read from left to right, and bear many other indications of a common origin.

Celtic Languages.—Of the four groups now enumerated, the Celtic appears to be the most ancient. It differs very considerably from the Sanscrit, and more from each of the other three groups than they differ from each other. Celtic nations formed the vanguard of the great Japhetic army that, before the dawn of history, migrated westward, and became the earliest inhabitants of Europe. For the most part they entered that continent on the north side of the Mediterranean; ascended the Danube and Save; settled in Illyria, the Tyrol, Switzerland, Belgium, France, and the British Isles; though some of their number migrated westward along the south side of the Mediterranean, and entered Spain by the Strait of Gibraltar. This migration occupied many centuries, and before it was concluded the main body became divided into two great sections

(the *Gael* and the *Kymri*), who, in the course of ages, came to speak languages unintelligible to each other, though closely allied both glossarially and grammatically. These are the Gaelic and the Kymric; each of which, in the course of time, branched off into three dialects (p. 106):—

Gaelic or *Erse Branch*, including
Irish, spoken in Ireland.
Scottish Gaelic, in North and West of Scotland.
Manx, in Isle of Man.

Kymric Branch, or *Ancient British:*
Welsh, in the principality of Wales.
Cornish, in Cornwall (now extinct).
Breton or Armoric, in Bretagne.

Ancient Localities.—Though the Celtic languages are now confined to the British Isles and the north-western corner of France, they were spoken at one time over a large portion of Europe. At the commencement of the Christian era, Celtic and Gothic nations divided all Western Europe between them; and were separated from each other by the Rhine, which still, in a great measure, forms the boundary between the races, though not between the languages. For a lengthened period both branches of the Celtic have been disappearing before the more highly cultivated English and French. Yet they are highly expressive and euphonious tongues; they come down to us as monuments of the most remote antiquity, and of late have become objects of the deepest interest to philologists, who discover in them most precious materials for illustrating the science of comparative grammar. From five to six millions of persons presently speak dialects of Celtic—viz. Irish, 3,000,000 at home, and 1,000,000 abroad; Scottish Gaelic, 400,000 in Scotland, and 100,000 in the colonies; Welsh, 700,000 in Wales, and 50,000 in the cities of England; Armoric, 800,000 in France.

Physiological and Intellectual Character.—The pure Celt is of middle size and slender make; sallow complexion; black hair, rarely curled, but turning grey at an early age; grey or dark-brown eyes; face and upper part of the skull oval; chest narrow; legs slightly curved inwards; feet small; temperament bilious, or bilious-nervous. Quick in perception, with great powers of combination and application; sensitive, proud, irascible, but easily calmed; fond of equality, society, and military glory; polite, hospitable, brave, but superstitious; incautious and imprudent.

Teutonic Languages.—These have all a close resemblance to each other, both in their roots and inflexions, and are intimately allied to the Sanscrit. Anciently they were highly inflexional, like the Greco-Latin family, but now employ auxiliaries for the conjugation of verbs and prepositions for the inflexions of nouns. Though not so plastic as the Greek, or even the Sclavonic tongues, they are bold, vigorous, and capable of expressing all shades of thought. We first find Teutonic nations in the region S. of the Caspian Sea in the eighth century before Christ. It was to this region that the ten Israelitish tribes were transported by the King of Assyria, B.C. 721. In all likelihood the two peoples amalgamated. Then commenced their great migration westward, so ably delineated by Sharon Turner in

his 'History of the Anglo-Saxons.' Possessed of indomitable energy and force of character, the Teutonic nations either subjugated or drove before them such Celtic tribes as they came in contact with. In the fourth century they overthrew the great Roman Empire, and they have almost invariably been able to retain possession of the territories they have once acquired. Their deep and patient reflection has led to the most important inventions and sublimest discoveries of modern times, as the watch, gun, steam-engine, art of printing, and the law of gravitation; and to this race belong the brightest names of modern science and literature, as Newton, Milton, Shakespeare, Bacon, Luther, Goethe, Humboldt, and Liebig. The Teutonic languages, like the Celtic, branch off into two main sections.

German Branch, including
German, in Germany, Switzerland, and United States.
Dutch, in the Netherlands and Cape Colony.
Flemish, in the North of Belgium and N. Brabant.
English, in British Isles, British Colonies, and United States.
Scotch, in Lowlands of Scotland.

Scandinavian Branch, including
Icelandic, in Iceland.
Faröese, in the Faröe Isles.
Danish, in Norway and Denmark.
Swedish, in Sweden.

Extinct Languages of this Class.—Gothic, Alemannic, Old Saxon, and Anglo-Saxon, the last of which is the parent and basis of the modern English.

Ancient Localities.—Media, Germany, between the Rhine and Elbe; the southern part of Scandinavia; Bulgaria and Servia. The Teutonic tribes that most distinguished themselves in the Middle Ages were, the Franks, Burgundians, Alemans, and Visi-Goths, in Gaul; Goths, Longobards, and Heruli, in Italy; Vandals and Ostro-Goths, in Spain; Angles, Jutes, and Saxons, in England.

Physiological Character.—Above middle size, and disposed to corpulency; chest broad; bones thick; legs straight; feet often large and clumsy; great strength of muscle; fair complexion, with flaxen, reddish, or golden-coloured hair; large blue eyes; ruddy cheeks; broad, high brow; skull larger and rounder than the Celtic variety; temperament sanguine and phlegmatic.

Intellectual and Moral Character.—Slow but accurate in perception; great depth and penetration of mind, but not so sparkling and brilliant as the Celt; strong desire for personal independence and political self-government; cautious, reserved, and provident; hospitable, but not very sociable; fond of titles and social distinctions; haughty, overbearing disposition, and reckless of the rights of other nations; sincere; forgetful of injuries; skilful seamen; fond of spirituous liquors; great musical talent.

Sclavonic Languages.—This family of languages belongs to the centre and east of Europe. With the exception of Hungary, Moldavia, and Wallachia, they extend without interruption from the

Black Sea to the Baltic, and from the Adriatic to the Yenisei; they occupy more than a third part of Europe, and are spoken by about 70,000,000 of people. Though not *immediately* derived from the Sanscrit, they bear to it a very close affinity, and resemble it more nearly than any other Indo-European family, except the Greco-Latin and Indian branches. They are distinguished by the richness of their vocabulary, by their great abundance of synonyms, and by their numerous inflexions, which are placed both at the beginning and end of words. The last-mentioned property imparts to them a great facility of creating from each radical an extraordinary number of derivatives; from native roots they easily form all those technical and scientific terms which the languages of Western Europe derive from the Greek and Latin. In the number of their declensions, tenses, and participles, they excel all other European languages; and they possess such expressiveness and energy that they are capable of representing every object of the imagination in a manner not inferior to the most highly-cultivated modern tongues. The inferior estimate usually formed of their euphony and sonorousness mainly arises from the attempt to express in Roman letters sounds that are wholly peculiar to the Sclavonic languages. Like the two former families, the Sclavonic tongues are arranged under two branches.

South-Eastern Branch, including

Russian, in the great plain of North-Eastern Europe.
Russniak, in Galicia, Hungary, Volhynia, Podolia.
Bulgarian, Servian, Dalmatian, Croatian, Bosnian—all in the basin of the Lower Danube, and on the Drave and Save.
Wendish, middle of Lower Germany.

North-Western Branch—

Polish, in Poland, on the Vistula and Niemen.
Bohemian, or Tchekhian, in Bohemia and Moravia.
Slowak, chiefly in the north-west of Hungary.
Lettish, on the Baltic coast, between the Niemen and Lake Peïpus.
Lithuanian, in Wilna, Grodno, Minsk, and Smolensk.

Ancient Localities.—The early history of the Sclavic nations is involved in much obscurity. They probably left the banks of the Ganges in the seventh or eighth century before the Christian era. The early Greek and Roman historians frequently mention them under the names of *Slavi*, *Antæ*, *Vandals*, *Veneti*, and *Vends*, all of whom were descendants of the ancient Sarmatæ. In the sixth century of our era they began to ascend the basin of the Danube, and to form settlements on both sides of that river: since then they are frequently mentioned by the Byzantine historians as performing an important part in European history.

Physiological Character.—In stature stout, broad, and squat-built; neck short and thick; hardy in constitution, with strong bones and straight muscular limbs; complexion sallow, forming a mean between the Gothic and Celtic races; eyes grey or hazel-brown, and deeply set in the head; hair bristly, dark, of different shades, and rarely curled; skull and face square and angular; cheek-bones prominent; brow low, and the hair growing far down on it; temperament phlegmatic, or sanguine-bilious.

Intellectual and Moral Character.—Great mechanical, musical, and imitative talent; frank and open when in the enjoyment of freedom, but cunning, deceitful, and revengeful when subjected; their statesmen become admirable diplomatists; originally leading a nomadic life, they are still attached to the patriarchal form of government; blindly obedient to their sovereign, who is regarded as a father; extremely tenacious of the manners and prejudices of their ancestors. They are further characterised by a want of cleanliness; by their love of lyrical, and especially elegiac, song; and above all, by their invincible hatred of the Teutonic race, who have oppressed them for a thousand years, as well as by their long-cherished aspirations after Panslavism.

Greco-Latin Languages.—These comprehend all the languages derived from the ancient classical tongues of Greece and Rome. They are spoken over the entire south of Europe, from the Atlantic to the Dniester, and from the southern limits of Germany to the Mediterranean—with the exception of the northern portion of the Hellenic peninsula, the Basque Provinces, and Bretagne. All the larger islands of the Mediterranean, except Malta, are peopled by nations speaking Greco-Latin tongues. The origin of the Greeks and Latins, in common with that of the Celts, Goths, and Sclaves, is lost in the darkness of the pre-historic period. Modern ethnographic science, however, leaves little doubt that the two nations referred to were, respectively, the earliest inhabitants of Greece and Italy; that they stood to each other in the closest affinity, both of them being the immediate descendants of the Pelasgi, who appear to have formed the first great wave of population that broke on the shores of south-eastern Europe, and that permanently covered Asia Minor, Thrace, Macedonia, Greece, and Italy. This migration probably took place about 2000 B.C., but was succeeded by numerous similar migrations of the same stock of nations (including the Hellenes, who were no doubt nearly allied to, if not identical with, the Pelasgi) down to 1350 B.C. In subsequent centuries other great bodies of colonists appear to have entered Europe from other parts of Asia, forming the ancestors of the Celtic, Teutonic, and Sclavonic nations; but the Pelasgi formed, from the very first, the great bulk of the population of Italy and Greece. The part of Asia from which the Pelasgi set out appears to have been Northern India; for the Sanscrit, the ancient and sacred language of India, has a marked and very decided affinity to both Greek and Latin. The Greek, especially, is more closely allied to the Sanscrit than any other European tongue. In some respects, however, the Latin surpasses the Greek in retaining the features of its venerable parent, and it is in no way to be regarded as a descendant, far less a corruption, of the language of Greece. They are sister-tongues, deriving from their common parent every feature in which they resemble each other; but exhibiting many differences, arising from the different fortunes of each.*

* For the precise relation in which the two ancient classical tongues stand to each other, we may refer to Bopp's 'Comparative Grammar of the Indo-European Languages;' to Latham, 'On the English Language;' and (what is more interesting and satisfactory than either) to the article "Language" in the 'Penny Cyclopædia.'

Greek, or Eastern Branch—
Ancient Greek—Spoken in Greece from the earliest times, and afterwards in numerous other countries.
Modern Greek or Romaic—Greece, the Archipelago, and parts of the Turkish Empire.
Latin, or Western Branch—
Ancient Latin—Now a dead language, was the original language of Italy, and afterwards spread over the greater part of the Roman Empire.
Italian—Italy, part of Switzerland, Corsica, Sardinia, Sicily, &c.
Spanish—Spain, *Canaries, Cuba, Mexico, Spanish America, Philippine Isles,* &c.
Portuguese—Portugal, Madeira, Azores, *Brazil,* &c.
French—France, Channel Isles, parts of Belgium and Switzerland, *Lower Canada, Louisiana, Algeria, W. Indies, French Guiana.*
Wallachian—Wallachia, Moldavia, Bessarabia, Transylvania.
Thraco-Illyrian Branch, viz.—
Albanian or Arnaute—The eastern coast of the Adriatic, especially Albania, Servia, and Dalmatia; but of doubtful position here.

Ancient Localities.—No other language, ancient or modern, has been so widely diffused as the Greek, except Arabic and English. Greece, Asia Minor, Macedonia, Thessaly, and Epirus were its earliest seats: it was diffused by the early Greek colonies along both sides of the Mediterranean, as Cyrene, Syracuse, Tarentum, and Smyrna; was extended by Alexander and his successors to a large portion of Western Asia, including Asia Minor, Syria, and the cities of Palestine; and was spoken in many parts of Egypt under the Ptolemies. The conquest of Greece by the Romans, B.C. 146, tended still further to its diffusion, while under the Cæsars it was more extensively cultivated than at any former time. After the fall of the Western Empire, and the extinction of learning in the West, Greek literature and philosophy found an asylum in Constantinople, till that city was taken by the Turks, A.D. 1453; at which time it ceased to be spoken in its purity anywhere. It still, however, remained a living language in its original home; and even to this day the modern Greeks can peruse with comparative ease the productions of Homer, Xenophon, and Demosthenes. In short, it has remained a living language for the astonishing period of 3000 years. The Latin, in like manner, was the principal language of Italy from the earliest times. As the Roman power extended, it became more and more widely diffused, in many cases mingling with and remoulding the dialects of the conquered nations, and thus originating the modern languages of Southern Europe. After the fall of the Roman Empire it ceased to be a spoken language, but during the lengthened period of the middle ages it continued to maintain its supremacy as the language of literature, philosophy, legislation, and religion. Since the establishment of the papal hierarchy to the present day, it has maintained its place as the liturgical language of the Romish Church; and it is still extensively cultivated by every civilised nation, on account of the treasures contained in the vast repositories of its literature.

Modern Languages belonging to this Stock.—The Romaic differs little more from ancient Greek than some of the dialects of that language differed from each other; and the changes that have arisen are more perceptible in the grammar than in the vocabulary. The main differences now existing between the various languages of the Roman branch arise

mainly from the different character of the languages spoken in these localities before the Latin was engrafted on the original stock. Italian, Spanish, and French have diverged from the parent stem far more widely than the Romaic from the ancient Greek. The French has effected the widest separation, and the Italian and Spanish the least; while the Portuguese may be regarded as almost a *dialect* of the Spanish, the two languages being radically identical. Though the basis of the Wallachian is altered Latin, about one-half of its words are derived from Greek, Turkish, and Sclavonian sources. The Albanian is so different from every other member of this family that it seems doubtful whether it can claim a place among them. It contains the remains of a language now long extinct, but which probably formed a connecting-link between various families of tongues, more especially between the Greco-Latin and Sclavonic.

III. Religions of Europe.—These, though extremely numerous, may all be reduced to three classes, which harmonise in a very remarkable manner with the races and groups of languages above described. The Caucasian race are Christians; the Mongolian race, Heathens; while the Turks, who form a connecting-link between these races, profess Mohammedanism—a religion which equally connects Christianity with Paganism; and what is still more remarkable, Teutonic nations have embraced Protestantism—that is, Christianity reformed from the abuses of centuries; the Celtic and Greco-Latin nations profess Catholicism; while those speaking Sclavonic tongues belong to the Greek Church.

To the latter generalisation, however, there are some important exceptions; because language does not strike so deeply into the roots of humanity as race does. Language shares in the fortunes of the nation that speaks it, and is subject to numberless vicissitudes; while the stamp derived from race remains indelible for ages. Accordingly we find considerable sections of the Celtic nations becoming Protestants, as the Scottish Gael and the Welsh; Austria, though speaking a Teutonic language, largely professes Catholicism; the Magyars, a Mongolian race, and speaking a Mongolian language, are to a large extent Protestants; and the inhabitants of Greece, instead of belonging to the Roman Catholic, are stanch adherents of the Greek Church. The following table shows the estimated numbers belonging at present to the different races and religious denominations of Europe:—

Race.		Religion.	
Celtic, pure and mixed	80,000,000	Roman Catholic	140,000,000
Teutonic do.	103,000,000	Greek Church	68,000,000
Sclavonic do.	72,000,000	Protestant	68,500,000
Mongolian and Tartar	28,000,000	Mohammedan & Heathen	6,600,000
Jewish	4,400,000	Jews,	4,400,000
Gypsies, &c.	1,249,000	Gypsies, &c.	1,149,000
Total of Europe,	288,649,000		288,649,000

THE BRITISH EMPIRE.

THE British Empire is the largest, the most powerful, and, with one exception, the most populous on the surface of the earth. In extent of territory it even exceeds the Russian Empire; in point of population it is second only to the Chinese; while in wealth, civilisation, and moral influence, it has no rival. Its magnitude, however, will be more easily realised by comparing it with the other largest states in both hemispheres. According to the most recent statistics, the dates of which are given in detail in the following table, the area of the British Empire, including the Protected States of India, amounts to 8,727,651 sq. miles, and the population to 243,327,065. The next largest empire is that of Russia, which has an area of 7,867,094 sq. m., and a population of 78,400,000; the area of the Chinese empire is estimated at 4,693,000 sq. m., and the population at 477,500,000; the fourth in size is the United States of America, with an area (including Alaska) of 3,591,849 sq. m., and a population (in 1868) of 38,422,995; while the only other empire that can compare with it is that of Brazil, with an area of 3,231,000 sq. m., and a population of only 11,780,000.

TABLE OF BRITISH POSSESSIONS.

Name.	Capital.	Area in English sq. m.	Population.
British Isles (1869),	London	122,550	31,015,234
Heligoland (1863),		1	2,172
Gibraltar (1861),		2	24,095
Malta and Gozo (1866),	Valetta	142	146,852
Total in Europe,		122,695	31,188,353
British India (1866),	Calcutta	988,091	150,767,851
Protected States (1866),		625,278	50,465,366
Ceylon (1866),	Colombo	24,700	2,088,027
Straits Settlements (1862),		1,095	282,831
Hong Kong (1867),	Victoria	32	117,471
Labuan (1867),		45	3,828
Aden and Perim (1863),		5	20,000
Total in Asia,		1,639,246	203,745,374

Name.	Capital.	Area in English sq. m.	Population.
Gambia (1861),	Bathurst	21	6,939
Sierra Leone (1866),	Freetown	468	41,806
Gold Coast and Lagos (1866),	Lagos	6,000	151,346
Cape Colony (1868),	Cape Town	196,236	566,158
Natal (1868),	Pietermaritzburg	19,347	193,103
Basutu Land (1868),		7,654	60,000?
Mauritius, Amirantes, and Seychelles,	Port Louis, &c.	1,000	340,664
St Helena and Ascension (1861),	Jamestown	82	7,260
Total in Africa,		230,773	31,367,000
Dominion of Canada, (including Newfoundland & Hudson Bay Company's Territory (1868),	Ottawa	3,308,921	3,993,000
Prince Edward Island (1866),	Charlotte Town	2,173	90,000
British Columbia (including Vancouver Island (1861),	New Westminster	213,000	54,600
Bermudas (1863),	Hamilton	24	11,796
Bahamas (1867),	Nassau	5,124	39,859
British Honduras(1861),	Balize	13,500	25,635
British Guiana (1861),	George Town	99,925	155,026
Jamaica (1861),	Spanish Town	6,400	441,255
Lesser Antilles (1861),		3,262	461,279
Falkland Islands,	Stanley Harbour	4,741	662
Total in America,		3,657,070	5,273,000
New South Wales (1867),	Sydney	308,560	438,937
Victoria (1867),	Melbourne	88,451	659,855
South Australia (1867),	Adelaide	380,602	176,298
West Australia (1867),	Perth	975,824	21,605
Queensland (1867),	Brisbane	668,259	99,299
North Australia,		523,531	uncolonised
Tasmania (1867),	Hobart Town	26,215	98,455
New Zealand (1867),	Auckland	106,259	258,663
Auckland and Norfolk Isles,		166	338
Total in Oceania,		3,077,867	1,753,338
Total British Emp.		8,727,651	243,327,065

GENERAL VIEW OF THE BRITISH ISLES.

Position and Boundaries.—The British Isles, or United Kingdom of Great Britain and Ireland, form an extensive archipelago in the North Atlantic Ocean, at a small distance from the western shores of Central Europe, from which it is separated by the North Sea, the Strait of Dover, and the English Channel. It consists of two large islands—Great Britain and Ireland—and of about 5500 smaller islands and rocks. Of these, 500 are contiguous to Great Britain, and 5000 to Ireland. At the date of the last general census, only 420 of them were found inhabited—175 of which were adjacent to Great Britain, and 245 to Ireland.

Form.—The general outline is very irregular; but omitting the Shetland, Norman, and Scilly Isles, it approximates to the form of a scalene triangle, with its longest side turned to the east, and its shortest to the south. The group, as a whole, is broken up into a number of smaller ones, which arrange themselves, either singly or in clusters, around the larger islands. Thus, Great Britain is surrounded by the Orkney and Shetland Isles, the Outer and Inner Hebrides, Bute and Arran, Isle of Man, Anglesea, Scilly Isles, and Isle of Wight; while Ireland is in like manner accompanied by Rathlin Island, Torry Island, Arranmore, Achil Island, Clare Island, Valencia, and Cape Clear. The east coast of Great Britain is singularly destitute of Islands; and the arrangement into clusters is more characteristic of the British than of the Irish Islands.

Area and Dimensions.—Situated between 49° 13′ and 60° 49′ N., and between 1° 45′ E. and 10° 32′ W. lon., the entire archipelago occupies 11¾° of lat. and 12¼° lon. The trapezium formed by the parallels and meridians that pass through its extreme points is thus 800 miles long, from north to south, with an average breadth of 490 miles. The square content of this trapezium is about 392,000 square miles, but more than two-thirds of it is covered with water; and the actual area of the land is only 122,550 square miles, or $\frac{1}{16}$ of the area of continental Europe. Great Britain is the largest island in Europe, and the seventh largest in the world, being only exceeded by Australia, Borneo, Papua, Sumatra, Niphon, and Madagascar. Its length is 608 miles, breadth 280; area 83,826 sq. miles, or, including the adjacent islands, 90,038 sq. miles = 56,000,000 imperial acres, or $\frac{1}{77}$ part of Europe.

Extreme Points.—Unst, in Shetland, is the most northern part of the British archipelago; Jersey, in the Channel Isles, the most southern; Lowestoft Ness, in Suffolk, the most eastern; and Blasket I., in Kerry, the most western.

The longest day in Jersey is three hours shorter than in Shetland,

where, at the summer solstice, it is 19 hours long. Here a bright twilight continues all night, and books of a small type may be easily read at midnight. The sun rises on the E. coast of England 49 minutes earlier than on the W. coast of Ireland. Greenwich time, therefore, which is now followed on all the railways of Great Britain, would be greatly at fault if extended to the sister island.

Comparative Position.—The parallel of latitude which passes through Unst, in the extreme N. of the archipelago, proceeds *eastward* through Christiania, Stockholm, St Petersburg, and Yakutsk; and *westward* across C. Farewell in Greenland, and Mount St Elias in Alaska; the parallel of Jersey in the extreme S. proceeds eastward to Paris and Vienna; and westward along the northern boundary of the United States: while the central parallel of 55° passes over Londonderry, Newcastle, Copenhagen, Moscow, Tomsk, and Nain in Labrador. The central meridian (of 4° 23′ W.) runs considerably to the east of the Farŏe group, through Anglesea and Cornwall, between Brest and Madrid, and 1° E. of Gibraltar.

Population.—In 1801, the year of our first regular census, the population of the British Isles amounted to 15,942,646. In 1861 it had increased to 29,307,119. In May 1869, the Registrar-General estimated it at 31,015,234, or 253 persons to each sq. m. Thus, while in the United States the population doubles itself in 25 years, in the United Kingdom it scarcely doubles itself in 68 years. This comparatively slow rate of increase arises from various causes, the principal of which have been emigration and famine. In the year last named, the population of England was estimated at 21,869,607; of Scotland, 3,205,481; and of Ireland, 5,546,343.

An immense tide of emigration is constantly leaving our shores. In 1867 there emigrated from the British Isles, 195,953—or 537 per day. Of these, 159,000 went to the United States, 14,000 to Australia, and 15,500 to British America. Since the year 1815, the number of emigrants from the United Kingdom has amounted to 6,302,345; while in the ten years 1858-67, it averaged 162,000 per annum. The destruction of the potato crop in 1846-7, and the consequent famine in Ireland and the Highlands of Scotland, had a mighty effect in reducing the population. In Ireland alone it is estimated that 1,000,000 of the people died of famine and disease in two years, while a million more emigrated. In Great Britain alone the population has more than doubled during the last half-century. In 1801 it was 10,578,000, including the adjacent islands; it is now 23,122,842. This gives 257 persons to every sq. m., and 2½ acres of land to every person. This dense population is equally divided between town and country, there being about 11½ millions in each. The number of cities, county towns, and market towns in the island is 815, of which 580 are in England and Wales, with an average population of 17,300; and 225 in Scotland, with an average population of 8000.

Climate.—As compared with other countries of the same latitude, the climate of the British Isles, though variable, is remarkably mild and salubrious. There is no country in Europe where a working man can prosecute his employment out of doors for a greater number of days in the year, or of hours in the day. Surrounded by the ocean on all sides, and having a branch of the Gulf Stream flowing

along its western shores, the mean annual temperature is greatly higher than its geographical position in the middle of the North Temperate Zone would indicate. Of the six isothermal zones into which the meteorologist divides our hemisphere—viz., the equatorial, warm, mild, cool, cold, and frigid—the United Kingdom is situated in that one which, on the whole, is most desirable.

The **Mild Zone**, which embraces the entire archipelago, is bounded by the isothermal curves of 41° and 59° Fahr., and enjoys a mean annual temperature of 49°. The mean temperature of Unst, in Shetland, is 44°.7, and of Penzance in Cornwall, 53°; thus showing a difference of mean annual temperature between the two extremities of the archipelago of 7° Fahr., and a general average for the whole of 48°.7. In no other country, either in the Old or New World, does so high a mean temperature correspond with so high a latitude. For example, Edinburgh, Moscow, and Nain in Labrador, are situated nearly on the same parallel; but while the mean temperature of Edinburgh is 47°.13, at Moscow it is 40°, and at Nain 27°.8. Hence it appears that the British Isles possess a mean temperature of 7° higher than corresponding latitudes on the eastern, and of 20° higher than corresponding latitudes on the western continent. The winter temperature is still more dissimilar, being at Edinburgh 38°.45, at Moscow 15°.2, and at Nain 3°.7. Our winter is therefore 23° Fahr. warmer than at Moscow, and 35° warmer than in the corresponding latitude of the eastern side of North America.

The **isotherm** of 50°, which nearly expresses the mean annual temperature of the British Isles, in no part of the world attains so high a latitude as in Ireland, where it ascends, in the centre of the island, nearly to the parallel of Dublin, in lat. 53° 21′. From this point it rapidly descends in its passage eastward and westward—in the former, passing near London 51° 32′, Paris 48° 50′, Vienna 48° 13′, Astrakhan 46° 15′, and Pekin 39° 53′; and in the latter, New York 41° 0′, and the mouth of the Columbia 46°. These places are, on an average, 8½°, and one of them (Pekin) no less than 13½°, farther south than Dublin. So great, indeed, is the influence of our insular situation, of our mild westerly winds, and of the general drainage and cultivation of our soil, that the British Isles are fully as healthy as any country in the world, and our vegetation unrivalled under the same degree of latitude. Not only is our mean temperature very high, but the *range of temperature* is very small; the difference between the temperature of the hottest and coldest months being only about 24°, while at Berlin it is 38°, and at Moscow and St Petersburg no less than 57°. Hence we are exempted from those violent extremes which are so injurious to health and to animal and vegetable life. Accordingly, while in Ireland the broad-leaved myrtle grows in the open air as in Portugal, corn will not ripen in Labrador under the same latitude, and only hardy kitchen vegetables can be raised. Summer, in the British Isles, comprises the months of June, July, and August; autumn, September, October, November, and the first half of December; winter, half of December, January, February, and the half of March; and spring, the latter half of March, April, and May. July is the hottest month.

The **Prevailing Winds** are westerly for nine months of the year; but in March, April, May, and Nov. they are often easterly or northerly, and this season of the year is peculiarly trying to invalids, especially to those afflicted with consumption. The **average fall of rain** over the entire archipelago is above 40 in., but it is much greater on the W.

than on the E. coast of both Great Britain and Ireland—the mean fall of rain on the east coast of the former being 27.4 inches, and of the latter 29.7 inches; while on the west coast of the larger island it is 45.5, and of the smaller 47.4 inches. The average **number of rainy days** on the east coast is 165, and on the west 208. This great difference of climate between the E. and W. sides arises from the configuration of the land and the general prevalence of westerly winds charged with vapour from the Atlantic. These winds, striking against the colder mountain-ranges, lose their moisture and originate nearly all the principal rivers in both islands. In some parts of Westmoreland and Cumberland, as much as 150 inches of rain fall annually; at Seathwaite, in the latter county, the fall amounts to 183 inches; whereas at London, on the eastern side of the island, it is only 24, at Cambridge 20, Shields 25, Edinburgh 25, and Dublin 30.8 inches. The **limit of perpetual snow** in the S. of the archipelago is estimated at 6334 feet, on the central parallel 5034 feet, and in Shetland 3818 feet.

The mean **Height of the Barometer** at London at sea level and at 32° Fahr. is 29.956 inches, at Glasgow 29.829 inches, and in Orkney 29.791 inches. The barometric range is very great, especially in the N. of the archipelago, being in Orkney 3 inches. The *variation* or *declination of the magnetic needle* is much greater on the W. coast than on the E. At London in 1580 the needle showed an E. declination of 11° 36′; in 1663 it was at zero. From that year it gradually tended westward till it reached its maximum declination of 24° 41′ in 1818. Since then it has steadily diminished, being 22° 30′ in 1850, and 20°16′ W. in 1868. Calculating from these data we learn that in our country the needle makes one complete oscillation of 49° 22′ in 310 years. The *dip* or *inclination* undergoes a secular variation of a similar kind. At London, in 1820, it was 70° 3′, and in 1868, 67° 54′, diminishing by about 2′.6 annually. Lastly, the magnetic intensity, which is found to increase with the latitude, is at London 1.372; at the equator, 1.087; Naples, 1.274; Paris, 1.348; St Petersburg, 1.410; Spitzbergen, 1.567.

Geology. — By far the greater part of the surface of the British Isles is occupied by sedimentary and fossiliferous strata, ranging from the Silurian to the Tertiary. Igneous and metamorphic rocks prevail mainly in Scotland—a country which is also characterised by the preponderance of Silurian strata, by the extent and importance of its newer Palæozoic rocks, embracing all the formations from the Devonian to the Permian, and by the absence, for the most part, of strata belonging to the Mesozoic and Tertiary series.

England possesses in greatest abundance those formations of which Scotland is most destitute; for while only a small portion of her surface is covered by the older Palæozoic—viz., the north-western and south-western counties—the Secondary formations are widespread and highly developed, as are also the newer Palæozoic strata, to which her unrivalled coal-fields belong. The Chalk and Tertiary series are mainly confined to the south-eastern counties, especially to the basins of the Thames and Ouse. The Oolite, Lias, and Trias occupy nearly all the remainder of the country, especially the north-eastern and central counties from the eastern frontier of

Wales to the North Sea; but the north of England, from Derby to Berwick, is covered with the Coal-measures and the Carboniferous limestone. Wales consists, for the most part, of Silurian and Devonian strata, but the Coal-measures in the south are extensive and valuable.

A most interesting circumstance connected with the geology of England and Wales, and one which will greatly facilitate the mastering of the details, is the *order* in which the different formations occur, more especially in the broadest part of the kingdom. Supposing a geologist to set out from the Cambrian rocks of the west coast of Pembrokeshire, and to travel eastward till he arrives at the Tertiary deposits of Norfolk, he will have passed in review all the systems and formations of the entire fossiliferous series, and that, too, precisely in the order in which they are arranged in geological treatises, or in which they would be seen were a complete geological section of the earth's crust presented to his view! The order would be precisely the same should he make another excursion from Berwick to London along the coast, or even in a direct line, save that a few of the lower terms of the series would be wanting. Probably there is no country in the world, of equal extent, in which a similar succession could be found.

Ireland is essentially a Palæozoic country. Carboniferous limestone covers a large portion of the surface, and the Silurian and Devonian the remainder; only that extensive tracts of trap and granite prevail along the coasts — the former covering the entire north-east of Ulster between the Lagan and Lough Foyle, and the latter the greater part of the counties Wicklow, Carlow, Galway, and Donegal. Coal is found in many places, but the workable beds are of inconsiderable extent, and the quality is commonly inferior. The geology of the British Isles presents an admirable epitome of the geology of the globe; and it has been more thoroughly investigated than any other equally extensive portion of the earth's surface. Details, however, would be out of place here, more especially after the somewhat ample consideration given to the subject at pp. 41-52; but the prevailing characteristics of the geology of each of the counties will be found briefly indicated in the "Descriptive Notes" to England, Scotland, and Ireland.*

Minerals.—The minerals of the United Kingdom are a source of immense wealth, and, both in quantity and commercial value, greatly surpass those of any other country. The chief of these are coal, iron, salt, limestone, building-stones, copper, lead, tin, silver, and zinc.

Almost every mineral, indeed, of high economic value, is found more or less extensively in the British Isles; though some of them, as, for example, gold and quicksilver, occur in such small quantities

* For further details we must refer the student to the works of Sir Roderick Murchison, Sir Charles Lyell, Mr Hugh Miller, Dr Page, and especially to the beautiful "Geological and Palæontological Map of the British Islands," edited by Dr Keith Johnston, from materials supplied by the late lamented Professor Edward Forbes, forming Plates V. and VI. of the new edition of Johnston's 'Physical Atlas.'

as scarcely to repay the labour of extracting them. *Coal* and *iron* are the two commodities that have contributed most largely to raise our country to the high eminence to which it has attained among neighbouring nations. The coal-fields are not confined to any special locality, but are distributed in all directions over both the main islands. In England they commence at Northumberland, and extend through Durham, York, Lancashire, and Staffordshire into South Wales. In Scotland they form a broad belt across the country where it is narrowest, from the coast of Ayrshire to Fife-ness—extending on the west coast from the Clyde to the Doon, and on the east from the Eden to the Tyne. Detached tracts also occur in the counties of Berwick, Roxburgh, and Dumfries. Ireland is not rich in coal. Her six coal districts are situated in the Carboniferous limestone which covers the great central plain, and do not yield more than about 55,000 tons annually.

The total area of the Coal-measures in the British Isles is estimated at about 8000 sq. m. ; and it is calculated that, at the present rate of consumption (100 million tons per year), the supply will last for 1000 years. The number of collieries at work in 1865 was 3268, giving employment to 307,000 males. The value of the coal is immensely enhanced by its being associated with beds of iron ore. The ore could not be fused without the coal, nor without the aid of the mountain limestone, which acts as a flux and promotes its speedy reduction. In other countries where the coal is not associated with those other deposits—as in Silesia and France—the value of the mineral is restricted to its employment as an article of fuel.

Salt occurs chiefly in the county of Cheshire, where vast beds of rock-salt and brine-springs occur. *Limestone* is abundant in almost every part of England and Ireland ; *sandstone and granite* in numerous localities in Scotland ; *roofing-slate* in Wales, Cumberland and Argyllshire ; and excellent *statuary marble* in Donegal and Galway. *Copper* is most abundant in Cornwall, but occurs also in Staffordshire, Anglesea, Waterford, Cork, and Kerry. *Lead* is chiefly found in Derbyshire, Wales, and in the two most northern counties of England ; in the Lowther Hills in Scotland ; and in the southern counties of Munster. Lead ore generally contains a small quantity of silver. *Tin* occurs only in Cornwall and Devon, where it has been worked for ages ; and these mines supply about ⅔ of all the tin produced in Europe. Mines of *calamine*, or *zinc ore*, are worked in Derbyshire. *Antimony, manganese, arsenic, plumbago, fuller's earth*, and numerous other minerals, occur in various parts of the kingdom.

It is estimated that the value of the mineral productions of the United Kingdom for the year 1866 was nearly £41,000,000 sterling, more than £25,000,000 of which belong to the single article of coal, 100,600,000 tons being dug annnally. The value of the iron ore for the same year is estimated at £3,120,000 ; of copper and lead, about £1,900,000 ; of tin, silver, and zinc, collectively, £1,130,000 ; and of other minerals, including building-stones, about £6,000,000.

Botany.—The flora of the British Isles is wholly embraced

within Schouw's *second* phyto-geographic or North European region, described above (p. 82).

So closely does the vegetation of these islands resemble that of the neighbouring continent, that, with two or three exceptions, it does not contain a single plant which is not to be found in one or other of the countries beyond the Channel. The exceptions referred to are the three-toothed cinque-foil (*Potentilla tridentata*), the jointed pipe-wort (*Eriocaulon septangulare*), and a water-weed named *Anacharsis alsinastrum*. Even these are probably not indigenous to the United Kingdom, but appear to have migrated across the Atlantic from the New World. The British Isles cannot be regarded as a "centre of vegetation" (p. 53), but as having been colonised by a succession of vegetable migrations from the continent of Europe. Edward Forbes and others regard these migrations as having commenced as early as the epoch of the Middle Tertiary formation—when one unbroken continent extended from the Mediterranean to the British shores—and as having been continued till the present time.

Our entire flora may, however, be divided into four groups of plants, corresponding with the continental regions from which they are supposed to have migrated. Thus, we have—1. The *Germanic* group, which forms the grand staple of our vegetation, and embraces our trees, shrubs, weeds, and common wild-flowers, all of which are equally abundant in Germany, the Netherlands, Belgium, and north of France; 2. The *Scandinavian* group—found chiefly in the Highlands of Scotland, and more sparingly in the mountains of Cumberland, Wales, and Ireland, consisting of lichens, mosses, grasses, some flowering plants of great beauty, and several berry-bearing shrubs, as the cranberry, bilberry, and cloudberry—plants which are abundant in the mountains of Scandinavia and in the lowland regions of Arctic Europe; 3. The *Armorican* group in the S.E. of Ireland and S.W. of England, where the vegetation is closely allied to that of Brittany and Normandy, the ancient *Armorica;* 4. The *Asturian* group, in the S.W. of Ireland, where about 12 species of plants are found which are common in the mountains of Northern Spain, though occurring nowhere else in the British Isles,—as St Patrick's cabbage (*Saxifraga umbrosa*), the strawberry-tree (*Arbutus unedo*), and various species of heath.

Botanists vary considerably in their estimates of the total number of species belonging to our native flora, owing to the uncertainty that attaches to many species as to whether they are really native, or have been introduced by man. Thus Professor Balfour, in his 'Manual of Botany,' considers our indigenous species to amount to 4400, of which 3230 are common to England and Scotland. He states the number of flowering plants at 1600, and of the non-flowering or cryptogamic (embracing *algæ* or *sea-weeds, ferns, mosses, lichens,* and *fungi*) at 2800 species. The 'Physical Atlas' gives the number of our flowering plants as 1371, of which 340 are monocotyledons and 1031 dicotyledons. Of the 2000 known species of ferns, about 60 are found in the British archipelago, and of the 1100 mosses we have about 300. We have also numerous species of lichens, fungi, and algæ, though the statistics are less precise.

Of *forest-trees* acknowledged to be of British origin, the principal are the oak, elm, birch, beech, ash, alder, pine or Scotch fir, poplar, willow, yew, mountain-ash, maple, holly, and hawthorn. Of trees that are known to have been introduced by man from foreign countries may be mentioned the chestnut, lime, walnut, Norwegian spruce, larch, weeping-willow, Lombardy poplar, mulberry, and cedar. Our principal *fruit-trees* are the apple, pear, cherry, plum, peach, walnut, currant, gooseberry, strawberry.

Agriculture.—British farming has attained to an unrivalled degree of perfection. The general study of agricultural chemistry, and the consequent adoption of rotation of crops, together with the adoption of a thorough system of drainage, have mainly contributed to this result; but the vast number of good roads, canals, and railways that intersect the kingdom in all directions, and enable the agriculturist to convey the produce of his farm to the best market, has also very powerfully contributed to bring about the same result.

Estimating the area of the entire archipelago at 122,550 sq. m., or 78,000,000 acres, we learn from the Board of Trade Report for 1868 that there were in that year 45,652,000 acres under cultivation, of which 11,659,000 acres were under corn, 4,865,000 under green crops, 5,690,000 under clover and "rotation grasses," and 22,164,000 under permanent pasture. In every 100 acres in England 42 are in pasture; in Wales, 56; in Scotland, 23; and in Ireland, 64. The greater proportion of the inhabitants of Great Britain are engaged in manufacturing, mining, and commercial pursuits, while Ireland and Wales are strictly agricultural countries. The industrial pursuits of a country depend, to a great extent, on its geological character. Generally speaking, the most ancient geological formations are the richest in minerals, while the more recent are the best adapted for agriculture. Accordingly, if we draw a line from the mouth of the Tees, in Durham, to Leicester, and thence to Gloucester and the river Exe, we shall find that nearly all the mining and manufacturing districts of England lie to the W. of it, and all the agricultural districts to the E. In like manner, if we draw a straight line from Dundee to Dumbarton, and another from Berwick to Girvan, we shall have the limits of all the coal-fields and iron-mines of Scotland: all the great centres of commerce and manufactures, as also the principal harbours of the country, are found between these lines.

The *cereal* crops of the United Kingdom consist of wheat, barley, bigg, and oats. The total quantity of corn of all kinds annually produced is estimated at 51,480,000 qrs.; while the annual value of real property, as assessed under the Property-tax Act in 1864, was £323,000,000. *Other cultivated plants* comprise the potato, turnip, mangold, carrot, radish, beet, cabbage, pease, beans, hops, flax, hemp, vetches, clover, and rye-grass.

Zoology.—The fauna of the British Isles is wholly embraced

within the middle province of the first or European Zoological Kingdom—(see above, p. 57).

I. THE VERTEBRATA, or Mammals, Birds, Reptiles, and Fishes.

The **Mammalia** of the United Kingdom are represented by only four orders—viz., the Carnivora, Rodentia, Ruminantia, and Cetacea; the other four being wholly absent—viz., the Quadrumana, Marsupialia, Edentata, and Pachydermata. The last-named order is indeed represented by the horse, ass, and sow; but as they are no longer found here in their wild state, we do not take them into account. The orders actually represented embrace 60 species; but if we deduct the bats and the marine mammals, not more than 40 species will remain—a mere fragment of our mammalian fauna during the epoch of the Boulder Clay, when, in addition to the existing species, these islands contained the elephant, rhinoceros, hippopotamus, tiger, hyæna, the great elk, the gigantic deer, two species of beaver, and three species of bear. Several species—as the beaver, bear, wolf, wild ox, and wild boar—have been extinguished during the historical era by the cutting down of the forests, the cultivation of the soil, and the destructive effects of the chase; while not a few others have become very rare, as the badger, polecat, and squirrel. The *Carnivora* are represented by the fox, dog, weasel, ermine, foumart, martin, polecat; the hedgehog, mole, shrew, and badger; the otter, seal, and walrus; and by 9 species of bat. The badger is not found N. of the Caledonian Canal, nor the mole N. of the Pentland Firth, or in Ireland. The *Rodentia* embrace the squirrel, hare, rabbit, dormouse, 3 species of mouse, 2 of rat, and 4 of arvicola. The *Ruminantia* are 3 species of deer—the red, roe, and fallow deer; the ox, goat, and sheep. The *Cetacea* embrace the porpoise, grampus, sea-cow, and various species of whales and dolphins.

Birds are comparatively numerous in the British Isles; for while the total number of species belonging to Europe is only 490, no fewer than 274 are found in the United Kingdom, of which 230 are known in Ireland. Each of the six orders is largely represented. The *Raptores*, or Birds of Prey, include the golden eagle and earne, the hawk, kite, falcon, and various species of owl. The *Climbers* embrace the cuckoo, woodpecker, swift, goatsucker, hoopoe, and kingfisher. The *Songsters* are chiefly the lark, nightingale, linnet, bullfinch, wren, wagtail, titling, bunting, titmouse, swallow, and various thrushes. *Gallinaceous Birds* include the red-grouse (peculiar to this country), the ptarmigan, blackcock, partridge, common quail, and various species of pigeon. The capercailzie, or cock of the wood, some time ago extirpated, has been reintroduced recently from Norway. The peacock, turkey, common fowl, Guinea hen, and pheasant, are all of foreign origin. The *Waders* are represented by the bustard, craik, crane, plover, snipe, heron, and stork; and the *Swimmers* by the cormorant, gannet, gull, petrel, duck, and goose.

Of the 73 species of European **Reptiles**, only 14 occur in the British Isles. Of the four orders belonging to this class, the first, or *Tortoise* order, has no representative in our archipelago, save that the

hawk's-bill tortoise has been occasionally seen in the Hebrides, and the leathery tortoise in Cornwall. Of the *Saurians* there occur only 3 species—viz., 2 lizards and 1 skink; but numerous other species belonging to the order—some of them of most gigantic dimensions—existed here in the geological eras, as the crocodile, megalosaurus, iguanodon, ichthyosaurus, and plesiosaurus. Of the 15 European *Serpents* only 3 are found in the United Kingdom—viz., the blind-worm, snake, and adder or common viper, the last-named of which is alone venomous; and of the 23 European *Batrachians* there occur only the eft, toad, and frog.

Fishes.—Of the twenty-five provinces of marine life into which the late distinguished Professor Edward Forbes proposed to divide the waters of the globe, the British seas form a part of the third, or *Celtic province*. This province is confined to the European side of the Atlantic; embraces the Baltic, North Sea, English Channel, Irish Sea, and the entire western shores of the British Isles; and is bounded on the N., W., and S. by the Boreal, Virginian, and Lusitanian provinces, respectively. Its population is of a very mixed character, owing to numerous colonists from the regions lying to its N. and S; but it is distinguished as being the great field of the herring fisheries, and for the thorough investigation which its fauna and flora have received at the hands of British, Danish, and Swedish naturalists. Of the 8000 fishes already known to the ichthyologist, the seas, rivers, and lakes of the United Kingdom embrace 263 species. Fishes are usually divided into two orders—the *cartilaginous* and the *osseous*; the former embracing only a few British species, as the sturgeon, ray or skate, shark, dogfish, lamprey, pride, hag, and sailfish; and the latter a very great number, including the salmon, trout, char, herring, pilchard, pike, carp, gudgeon, cod, ling, tusk, whiting, sole, turbot, fluke, halibut, eel, perch, mackerel, and minnow.

II. INVERTEBRATED ANIMALS.—Our limits forbid our enlarging on the invertebrated fauna of the British Isles; and we can only state a few of the more interesting facts, referring the student for details to works on natural history.

Mollusca.—This division of the Invertebrata consists of animals having bodies composed of soft parts, without any internal skeleton, some of which are protected by shells, while others are naked; having white, cold blood; breathing organs, lungs, gills or branchiæ; and of limited senses and instincts. They are usually divided into five classes—viz., *Cephalopoda*, *Pteropoda*, *Gasteropoda*, *Acephala*, and *Brachiopoda*. These are subdivided into about 200 genera, and probably embrace 20,000 species (see p. 56). Of the *shell-bearing molluscs*, 392 species* (or 232 univalves and 160 bivalves) frequent the British seas; the most plentiful genera being Trochus, Lacuna, Patina, Rissoa, Pullastra, and Acidia. Though greatly inferior, both in size and beauty, to species inhabiting tropical seas, our shell-bearing molluscs are often highly ornamental; others, again, are largely used as articles of diet, as the oyster, mussel, cockle,

* Now about 520 species (see p. 21).

whelk, and limpet. The *Nudibranchiata*, or molluscs destitute of a shell, are also very numerous in the Celtic province.

Articulata, or jointed animals, also comprise five classes—viz., *Annulata*, *Crustacea*, *Cirrhopoda*, *Arachnides*, and *Insecta*; the first of which is represented by the earth-worm and the leech, the second by the crab and lobster, the third by the barnacle and balanus, the fourth by the spider and mite, and the fifth by the dragon-fly, bee, butterfly, moth, fly, and gnat. The number of British insects already known exceeds 10,000 species, one-third of which extend to Ireland.

The **Radiata**, so called from having their limbs or members branching off from a common centre, like the spokes of a wheel, also comprise five classes—viz., *Echinodermata*, *Entozoa*, *Acalepha*, *Polypi*, and *Infusoria*, which are represented respectively by the starfish and sea-urchin, the tape-worm, the medusa, the zoophyte or coral insect, and the small microscopic animals named animalcules, which embrace the lowest forms of animal life, and exist in countless numbers in vegetable infusions.

Ethnography.—The British people belong to two distinct varieties of the Caucasian family—the Celtic and the Gothic.

The **Celts** were probably the original inhabitants of the neighbouring continent, more especially of its western side; and, at a period prior to the dawn of history, migrated into Britain, and formed its earliest inhabitants. The great Celtic family, before arriving at their ultimate destination, became divided into two main sections, the *Gael* and the *Kymri*, who were mutually hostile, and spoke widely-different languages. The Gael seem to have been the earliest settlers in this island, but to have been speedily dislodged by the more powerful Kymri, and driven into Scotland, Ireland, the Hebrides, and the Isle of Man,—thus forming the ancestors of the Scottish Highlanders, the Irish, and the Manx. The Kymri occupied S. Britain as far north as the Grampians, and became the ancestors of the Welsh and the Cornish. The Kymri more resembled the inhabitants of Celtic Gaul in their language than the Gael did; and some of our most eminent ethnologists maintain that the ancient Picts and Caledonians were Kymric tribes, though others insist on their Gothic origin (p. 86). But the great bulk of the population belongs to the **Gothic Race**, partly to its Teutonic, and partly to its Scandinavian branch. To the *former* belonged the Anglo-Saxons, whose original home was the country lying S. of the Caspian, and afterwards Germany, between the Eyder and the Weser, and who began to invade the east of England in the year A.D. 449, continuing their incursions for a century afterwards. They overcame the Celtic tribes that then occupied the land, and drove them into the mountain-fastnesses of Wales and Cornwall. The next invasion of Britain took place about the beginning of the eleventh century, and those who took part in it were *Scandinavians*, chiefly Danes, under the celebrated Canute, who reigned over the Anglo-Saxons from A.D.

1017 to A.D. 1036. The last invasion of our shores was also by a Gothic tribe—viz., the Normans, who, under William the Conqueror, established their rule by the battle of Hastings, A.D. 1066, and changed the Anglo-Saxon language of the population into the modern English. Gothic tribes, therefore, form the great bulk of the present population of England, of Scotland south of the Grampians, of the N.E. coast of Scotland, including the Orkney and Shetland Isles, the N. and E. of Caithness, and Ulster. They have, moreover, largely commingled with the Celtic race in all the remainder of the British Isles, so that it is now very difficult to find an unmixed Celtic population anywhere. The following is an approximation to the relative proportions of the two races as they exist at present in the British Isles:—Of Celtic blood, pure and mixed, 11,470,000; Teutonic blood, pure and mixed, 18,200,000; completely intermingled, 1,345,000.

Languages.—The languages presently spoken in the British Isles are five in number—Irish, Welsh, Lowland Scotch, and French. The two first belong to the *Celtic Stock*, and represent the most ancient language in Europe. The Scottish Gaelic and the Manx are mere dialects of the Irish; and the Armoric of Brittany, and the now extinct Cornish of Cornwall, are nearly identical with the Welsh. But the Irish and Welsh branches are widely different, though their affinities are so numerous and close that they must be referred to the same stock. The English and the Lowland Scotch belong to the *Gothic Stock* of languages—the former to the Teutonic, and the latter to the Scandinavian branch.

The three Teutonic tribes above alluded to—the Jutes, Saxons, and Angles—who invaded Britain in the fifth and sixth centuries, all spoke dialects of the same language. The union of these dialects resulted in the formation of the Anglo-Saxon,—a language which maintained its purity till about A.D. 1258, when it began to amalgamate with the Norman French, which had been introduced about two centuries previously by William the Conqueror. The result of this amalgamation was the modern English, less refined, indeed, in its structure than some other tongues, but more widespread, and containing more literary and scientific treasures than any other, ancient or modern. It is essentially a compound language, and borrows freely from all sides, but still preserves to a great extent the lineaments of its parent. The Anglo-Saxon is the groundwork and substratum of the English; and however extensive, therefore, our knowledge may be of the Greek and Latin, we can never thoroughly understand our own language without an acquaintance with the Anglo-Saxon and other kindred Gothic tongues. The Lowland Scotch is no dialect of the English, and is not, like the latter, descended from the Anglo-Saxon, but is a parallel and sister tongue. Its true parent is the Norse—a Scandinavian and not a Teutonic language. In Caithness, Orkney, and Shetland, the geographical names are nearly all Norse; and throughout Scotland generally the language of the people is more akin to the Icelandic than to the Saxon. Instead of being regarded as a mere corruption of the English, it has all the qualities of a regular and cultivated language, and is possessed of a highly-fascinating literature. French is spoken in the Channel Isles,—the only portion of Normandy

now belonging to the English Crown, to which they have remained attached ever since the Conquest.

Religious Belief.—Christianity is professed, under some one or other of its forms, by nearly all the population of the British Isles; but in no other country, with perhaps the exception of the United States, is the religious community divided into so many sects. No fewer than 35 denominations are to be found in England and Wales; and for the entire kingdom there are at least 40. Perfect freedom of opinion on all subjects, and more especially complete toleration of all varieties of creed, are the main causes that originate this unparalleled multiplication of sects—the great and standing reproach of Protestantism. The 40 denominations may, however, be reduced to two great divisions—viz., Protestants and Roman Catholics. The proportion of the population belonging to each of these divisions is as follows:—Protestants, 22,817,000; Roman Catholics, 6,490,000. The Protestants, therefore, are to the Roman Catholics as 4½ to 1, the latter being found chiefly in Ireland, where they amount to 4,490,000. The total Roman Catholic population of Great Britain in 1868 was about 2,000,000.

The principal Protestant denominations in the British Isles are, the Episcopalians, Presbyterians, Independents, Baptists, and Methodists. The general census of 1861 does not furnish religious statistics for England and Wales. Here Episcopacy is established by law, and the Queen is the supreme governor of the Church. There are two archbishops—viz., of Canterbury and York, the former of whom is Primate of all England. He enjoys the privilege of crowning the sovereign of the realm, and of being the usual channel of communication with the Crown on constitutional questions affecting the interests of the Church. The province of Canterbury embraces 21 dioceses, each of which is presided over by a bishop. These dioceses are,—London, Winchester, Lichfield, Exeter, Worcester, Lincoln, Norwich, Rochester, Gloucester and Bristol, Oxford, Peterborough, Ely, Canterbury, St David, Bath and Wells, Llandaff, Salisbury, Chichester, St Asaph, Hereford, and Bangor. The province of York contains 7 dioceses,—Manchester, Chester, Ripon, York, Durham, Carlisle, Sodor and Man. Presbyterianism is established in Scotland. The Scottish Church has no hierarchy—all the clergy are on an equality, and the body is governed by kirk-sessions, presbyteries, provincial synods, and by the General Assembly which meets annually in Edinburgh, and which consists of delegates, both clerical and lay, sent up by the presbyteries, the royal burghs, and the universities. There are 80 presbyteries, 18 synods, and 1023 parishes. Previous to 1843, the Established Church embraced the great bulk of the population; but in that year a great disruption took place, in consequence of the interference of the civil courts with the spiritual privileges of the members, especially in the matter of election of ministers. The body thus formed is known as the Free Church of Scotland, which in doctrine, discipline, and government does not differ essentially from the Established Church, except in the matter above referred to. The Established Church and the Free Church have each about a third of the population. The United Presbyterian Church is also very numerously attended, embracing 600 congregations and about 180,000 members—nearly a fourth of the entire population. The only other religious bodies of importance are the Scottish Episcopal

Church, the Congregationalists, and the Roman Catholics. In Ireland, the hitherto Established Church is a branch of the Church of England, presided over by two archbishops (Armagh and Dublin) and 12 bishops. It embraces, however, little more than a seventh part of the population (being, in 1861, 678,661), and consequently, as the Church of the minority, it was disestablished and disendowed by Act of Parliament in 1869. Those in communion with the Roman Catholic Church were 4,490,000; Presbyterians and other Protestant Dissenters, 586,563.

Form of Government.—The Government of the United Kingdom is a limited monarchy. The legislative authority is vested in the Sovereign and Parliament, which consists of a House of Peers and a House of Commons; and the concurrence of these three Estates is necessary to the enactment of new laws, or the repeal of those already existing. The crown is hereditary. The House of Peers consists of about 460 members, including lords spiritual and temporal, and is composed of princes of the blood-royal, 2 archbishops, 24 English bishops, 20 dukes, 19 marquesses, 110 earls, 22 viscounts, 214 barons, with 16 Scotch and 28 Irish representative peers. The House of Commons consists of 658 elected members, of whom 500 are for England and Wales, 105 for Ireland, and 53 for Scotland. This gives 1 member to each 50,000 of the population. Parliaments are septennial, but generally expire sooner, and members of the House of Commons are elected for a single parliament. Any legislative measure may originate in either House, but the House of Commons possesses the exclusive privilege of originating money-bills, and voting money out of the revenue. In this single privilege lies the palladium of the commonwealth; for though the monarch may declare war with a foreign power and levy armies, the war cannot be prosecuted, nor the army paid, but by the consent of the representatives of the nation.

Army and Navy.—The extent of the British empire renders it necessary to keep up a large naval and military force; but owing to our insular position, our unrivalled navy, the equity of our laws, the purity of our religion, and the happiness and contentment of our people, there is no European nation that maintains so small a standing army, in proportion to its population. In 1853, before the commencement of the Russian war, the royal navy numbered 545 ships of all classes, which carried 18,080 guns, 58,000 seamen, and 18,616 marines. The army numbered 214,421 men, exclusive of militia; and the annual cost of both army and navy was £24,000,000. In 1870 the total strength of the army amounted to 191,073 men and officers, of whom 63,707 were in India, and 28,333 in the colonies. Besides these, we have 128,900 militia, costing £952,700; volunteers, 199,000, costing the Government £414,000. Our naval force in the same year amounted to 389 vessels, including 31 armour-plated ships, 4 floating batteries, 44 ships of the line, and 32 frigates; number of marines, 63,300. The total cost of the army was £14,230,400, and of the navy, £9,996,641; total, £24,227,041. In 1814, during the war with France, the expense of our army and navy cost the country £71,686,000. Our principal naval arsenals and dockyards

at home are those of Deptford, Woolwich, Chatham, Sheerness, Portsmouth, Devonport, Pembroke, and Haulbowline; and abroad, those of Gibraltar, Malta, Halifax, Bermuda, Antigua, Jamaica, Ascension, Sierra Leone, Cape Town, Trincomalee, Singapore, and Hong Kong.

Manufactures and Commerce.—Britain stands unrivalled among the nations both in the extent of her commerce and the variety of her manufactures. Several causes concur in rendering her commerce superior to that of other countries. By referring to a terrestrial globe, it will be seen that her metropolis stands almost exactly in the centre of the land-surface of the globe. But this favourable position would be of little avail were it not that she is surrounded by seas on all sides, and thus placed in circumstances to prosecute her commerce in all directions without encountering any physical obstacle. In addition to her insular position, she further enjoys the advantage of numerous excellent harbours, canals, roads, railways, and navigable rivers, by which her industrial products can be readily and cheaply conveyed to the seaboard. But perhaps the greatest physical advantage that Britain enjoys over other countries consists in the unrivalled extent and variety of her mineral treasures—especially those of coal and iron, which are usually found in close juxtaposition, the one affording the material of her manufacturing machinery, and the other the means by which that machinery can be wrought with advantage. Accordingly, all the great manufacturing centres of the kingdom are situated in or near the great coal-fields (see above, under "Minerals"). Our two most important manufactures are those of textile fabrics and of metallic goods. A large proportion of the population depend directly on these for support. The *woollen* manufacture, though the oldest in the kingdom, is now second in importance to the *cotton*, of which upwards of 10 millions of cwt. are annually imported, in the form of cotton wool, then wrought up into a vast variety of fabrics, and exported to all parts of the world.

Exports and Imports.—Our imports are chiefly of two classes—viz., food for our people, and raw material for our manufacturing industry. The home supply of the former is annually decreasing in proportion to the population, partly owing to deficient harvests, and partly from less land being devoted to the growth of cereals, pasture being more remunerative. Hence, during the last few years we have been obliged to import about one-half of the entire food of our people. In 1868 alone we paid for foreign corn no less than £39,000,000. Five-eighths of this supply came from distant countries (chiefly from N. America and Russia), and three-eighths from the nearest ports of Europe. Our total imports for 1868 amounted in value to £294,693,668, of which £227,700,000 were from foreign countries, and £66,993,547 from British possessions. Of foreign countries the United States stand first, that country having sent us to the value of £43,000,000, chiefly cotton; then came France (£33,800,000), Russia (£20,000,000), Egypt (£17,000,000, including transit), China and Netherlands, £11,000,000 each. The five principal articles of import are raw cotton, corn, wool, tea, and raw silk.

In the same year our exports amounted to £227,778,454, of which £174,060,000 were to foreign countries, and £53,717,000 to our colonial possessions. The foreign countries to which we export most are the Hanse Towns (£26,000,000), United States (£23,800,000), France (£23,500,000), Netherlands (£16,700,000), and Russia (£7,000,000). The principal articles of export are cotton, woollen, and linen goods, metallic goods, machinery, coals, and apparel. Speaking generally, one-third of our exports and imports together is carried on with our own possessions abroad. From India we get rice, cotton, silk, sugar, jute, indigo, tea, spices, and fine woods; from the West Indies, sugar, tobacco, coffee, rice, and rum; from the Australian colonies, gold, copper, and wool; from our N. American possessions, gold, timber, furs, fish, and oil. Our mercantile marine greatly exceeds that of any other country. In 1869 the number of British vessels that entered our ports was 25,074, carrying 8,751,899 tons; and of foreign, 17,611 vessels, carrying 4,123,878 tons; total 42,685 vessels, and carrying 12,775,777 tons. In the same year there left our shores 29,629 British vessels, and 19,582 foreign, with a total tonnage of 14,345,317.

Finance.—The estimated revenue for 1870 was £72,855,000, the chief items of which were customs, excise, taxes, stamps, property and income tax: the expenditure was £68,223,000, of which the interest on the Public Debt amounted to £22,454,000; army and navy, £24,227,000; and the expense of the expedition to Abyssinia, £5,000,000. The National Debt amounts to the enormous sum of £796,861,067, or upwards of £25 stg. for every man, woman, and child in the United Kingdom. It commenced in the reign of William III. (in 1689), and from that period, owing to our numerous wars with foreign States, has been constantly increasing. In 1697 it amounted to about £5,000,000; at the outbreak of the American War of Independence, in 1774, it did not exceed £128,000,000; at the conclusion of that war it amounted to £250,000,000; while at the termination of the French war it amounted to £848,282,477. Notwithstanding its perceptible decrease during the last 50 years, it is still nearly half as large as the combined debt of all other European States.

Inland Communication, in proportion to area, is also greatly superior to that of any other country. Our turnpike roads, canals, and railways, form a perfect network of communication, which extends to the remotest parts of both the main islands. On the first January 1870 there were 12,544 miles of railway open for traffic in the United Kingdom, of which 8890 were in England, 2105 in Scotland, and 1794 in Ireland. The total cost of construction amounted to £425,000,000, being £33,200 per mile. The number of passengers annually conveyed by them exceeds 200,000,000; and the total receipts for passengers and freight amount to upwards of £30,000,000 annually. So great is the safety of railway travelling, that only one traveller out of every sixteen millions is killed, and one out of every half a million injured. Our turnpike roads now exceed 35,000 miles, all of which are kept in excellent repair, and about 150,000 miles of cross-roads. Besides these we have 1800 miles of river-navigation that have been opened by artificial means,

and 2800 miles of navigable canals. During the last twenty years, moreover, 66,000 miles of telegraph-wires have been laid down, thus connecting by instantaneous communication all the cities, towns, and great maritime ports of the United Kingdom, and connecting the country by submarine cables with the continent of Europe, India, and America. On the 5th February 1870, the Government took into its own hands all the telegraphs of the country. These amounted, in 1867, to 15,000 miles; while on the Continent there are 80,000 miles, and 48,000 in America. Another mighty engine for furthering the interests of commerce and for promoting the intelligence of the people is the Post-Office, which has its branches and ramifications in all corners of the land. The number of letters transmitted in 1868 was 808,118,000, or 26 letters per annum for every individual of the population. Mr Rowland Hill's penny-postage scheme for inland letters came into operation in 1840; and a uniform rate of sixpence now suffices for carrying letters to the most distant of the British colonies. Books can be transmitted by post to any part of the kingdom at the rate of fourpence per lb., and to the colonies at threepence or fourpence per 4 oz.

Historical Sketch.—The British Isles were peopled by the Gael and Kymri long before the dawn of authentic history. It was not till a late period that the Greeks and Romans obtained any knowledge of them; but in early times the Phœnicians visited the Scilly Islands and the coasts of Cornwall for tin. Aristotle, the disciple of Plato and tutor of Alexander the Great (B.C. 342), is the first to record the existence of "two large islands in the ocean, named Albion and Erin." The Romans knew nothing of them personally till the Gallic war of Julius Cæsar, who twice invaded Britain (B.C. 55, 54). Cæsar's stay was of limited duration, and accompanied by no important result; and the Romans made no further attempt to conquer the island for 100 years. In the reign of Claudius they again landed, and permanently subdued the country south of the Thames. In the year 61 A.D. the Britons, under Boadicea, sustained another decisive defeat; and the conquest of south Britain was finally completed by Agricola (A.D. 78-84). In order to protect his newly-acquired territory from the incursions of the northern Celts, he erected a series of forts between the Firths of Clyde and Forth, calling the country lying to the south of it *Britannia Romana*, and that to the north Caledonia, or *Britannia Barbara*. The Romans, however, gave up the northern conquests of Agricola in the reign of Adrian (A.D. 121), and caused a wall to be built from the Solway to the mouth of the Tyne as the extreme limit of the Roman province. Early in the fourth century the Caledonians, who now appear under the names of Picts and Scots, broke through the wall, and Gothic tribes began to infest the coasts; but the declining power of the Empire was unable to afford the province any effectual assistance, and in the reign of Honorius all the Roman troops were withdrawn from the island (A.D. 418). About 30 years after the departure of the Romans, the Jutes, Saxons, and Angles, successively invaded south Britain, and drove the Kymri into Wales (A.D. 449). These

Gothic nations divided England into seven parts, each of which had its own chief; and their government is called the Saxon Heptarchy, which began in 582, and maintained its ground till the Danes under Sweyn invaded the country in 1013. The Normans, from France, subdued the country half a century afterwards; the battle of Hastings was fought in the year 1066, and the Anglo-Saxons were reduced to a state of slavery.

Of the subsequent history of the British Isles we can only enumerate a few of the most important facts. Ireland was subdued by Henry II. of England, A.D. 1172. Richard I., King of England, engaged in the Third Crusade in 1189. The *Magna Charta* was signed by King John in 1215. Wales was subdued and added to England by Edward I. in 1282. The first House of Commons was summoned to convene in 1265, and there has been a regular succession of parliaments since 1293. Wickliffe's translation of the Bible was executed in 1380, and Caxton introduced the art of printing into England in 1471. In 1468 the Orkney and Shetland Islands were bestowed by the King of Denmark on James III. of Scotland. In 1525 Tyndale's translation of the New Testament was published at Wittemberg, and nine years afterwards in England. The Reformation began in Scotland under Patrick Hamilton in 1528, and in England in 1536; in 1584 Virginia was taken possession of for England by Sir Walter Raleigh; and in 1588 the Spanish Armada was destroyed by the English. In 1603 the crowns of England and Scotland were united in the person of James VI.; and Barbadoes, Britain's first colony, established in 1604. A civil war in Britain terminated in the execution of Charles I. in 1649, and Oliver Cromwell became dictator for eleven years. In 1662 the Royal Society was instituted; in 1665 the plague broke out in London; and Newton's Philosophy was published in 1687. The celebrated Revolution took place in 1688, and William III. was called to the throne. The legislative Union of England and Scotland took place in 1707; and the first and second rebelliohs in Scotland in 1715 and 1745 respectively. The American War of Independence began in 1774 and terminated in 1783. The war with Revolutionary France commenced in 1793, and terminated by the battle of Waterloo in 1815. The legislative Union of Great Britain and Ireland took place in 1801, and was followed the same year by the first regular census of the British Isles. Coal-gas was first used for lighting apartments in 1792; the Surrey tram-railway, the first in Britain, was constructed in 1801; and in 1812 Henry Bell's diminutive steamer, "The Comet," the commencement of European steam-navigation, was launched on the waters of the Clyde. The Catholic Emancipation Act was passed by the British Legislature in 1829, and the Reform Bill in 1832. In 1842 the Tariff Reform was begun, which has resulted in Free Trade; and the first Industrial Exhibition of all nations took place in London in 1851. In 1854, Great Britain, in alliance with France, declared war against Russia, in consequence of its encroachments on Turkey; and in 1855 Sebastopol was taken by the allied armies of Britain, France, Turkey, and Sardinia. In

1856, Oude was annexed to British India, and in the year following the great rebellion broke out, by the Sepoys, at Meerut, shooting their officers and massacring all Europeans. In 1858, the rebellion having been suppressed, the Queen of England became Empress of India. A treaty of commerce between Great Britain and France was signed in 1860, and peace was established with China. The illustrious Prince Albert died in 1861; in 1862 the second International Exhibition was opened in London; in this year great distress was experienced in the manufacturing districts of England, America having ceased to supply us with cotton, owing to the civil war, and to the southern ports of the Union being blockaded by the U.S. Navy. In 1863, the Prince of Wales married the Princess Alexandra of Denmark, and in the year following the Ionian Islands were finally ceded by Great Britain to Greece. The year 1865 was marked by the death of Lord Palmerston and of Richard Cobden, by the commencement of Fenianism, and of the cattle plague in England, and by the Jamaica insurrection. In 1867, the new Reform Bill, which greatly extended the franchise, received the Royal sanction; in 1868, Sir Robert Napier, with a British force, captured Magdala and rescued the Abyssinian captives; the Disraeli Ministry resigned, and Mr Gladstone became Prime Minister. In 1869, the Irish Church was disestablished; while, in 1870, Government came into possession of the various lines of electric telegraph throughout the kingdom, and obtained the sanction of Parliament to a measure regulating the tenure of land in Ireland.

ENGLAND AND WALES.

Position and Boundaries.—England, including Wales, forms the south part of Great Britain, and is situated between lat. 49° 58′ and 55° 47′ N.; and between lon. 1° 45′ E. and 5° 43′ W.; thus occupying 5° 49′ of lat., and 7° 28′ of lon. It is bounded on the N. by Scotland, from which it is separated by the Tweed; on the E. by the North Sea; on the S. by the English Channel, which separates it from France; and on the W. by the Atlantic, St George's Channel, and the Irish Sea.

Form, Coast-Line, and Extreme Points.—In form it approaches to a scalene triangle: the base, from Land's End to South Foreland, is 317 miles; the east side, from South Foreland to Berwick, 345 miles; and the west side, from Berwick to Land's End, 425 miles. Lizard Point forms the extreme south of the mainland; Lowestoft Ness, in Suffolk, the extreme east; Berwick the extreme north; and Land's End in Cornwall the extreme west. The perimeter of the triangle above mentioned is 1087 miles; but when the principal in-

dentations of the coast are included the sea-margin is at least 2000 miles, affording 1 mile of coast to every 29 sq. m. of surface. The principal indentations are on the W. side, especially the Bristol Channel, Cardigan Bay, Morecambe Bay, and the Solway; those on the E. side are the Humber, Wash, and the estuary of the Thames.

Area and Population.—The area is 58,320 sq. m.; being 50,922 for England, and 7398 for Wales; and amounts to a little more than $\frac{1}{4}$ of the area of the entire island, which is, in turn, $\frac{1}{74}$ of the area of Europe. In 1861 the population was 20,066,224; or 18,954,444 for England, and 1,111,480 for Wales; but in 1868 it was estimated at 21,869,607; while in 1811 it was only 10,164,256. It has thus nearly doubled itself in the half-century. The population per sq. m. is 344, or 372 for England without Wales, which is thinly peopled. England is, therefore, one of the most densely peopled countries in the world. The most populous counties are Middlesex, Surrey, Lancashire, and Yorkshire. There are 7824 persons to every sq. m. in Middlesex, and 1345 in Lancashire; while there are only 79 in Westmoreland, and 59 in Radnor.

Political Divisions.—England is divided into 40 counties, and Wales into 12. The English counties are most conveniently arranged into 7 eastern, 10 southern, 7 western, and 16 midland counties.

In the following table, which includes all towns above 1000 inhabitants (680 in number), the population is given in every case where it amounts to 5000, as also the river on which the town stands. Towns between 1000 and 5000 are put in small type, while the rivers on which they stand will be found in the River System of England, p. 138.*

Seven Eastern Counties.

Northumberland. — Newcastle, 109,† Tynemouth including North Shields, 34 (Tyne), Morpeth 14 (Wansbeck), Alnwick 6 (Aln), Berwick 13 (Tweed).

Hexham, Haltwhistle, Bellingham, Blyth, Wooler, *Otterburn*.

Durham.—Durham 14, Sunderland with Wearmouth 80, Bishop-

* The student's attention is particularly requested to the *order* in which the towns and rivers are given. It is as nearly as possible the same as that in the extended table, entitled "Table of Rivers and Towns" (p. 137). The capital of the county, however, stands *first*, and is followed by all the large towns standing on the same river as the capital, beginning at the mouth and proceeding upwards, or beginning as near the mouth as the boundary of the county will allow. Should the capital stand on a *tributary river*, all the other towns in the county on that tributary are placed immediately after it; and then those on the main river, beginning at its mouth; and, lastly, those on the other tributaries, in the order in which they stand in the River System at page 138. Thus all the towns in any county belonging to one river-basin are enumerated before those belonging to any other river-basin are entered on. The name of the river is put within parentheses.—The order of the small towns is precisely the same as that of the large.

† The numerals following a city or town denote so many *thousands:* thus Newcastle 109, signifies that the population of Newcastle amounts to 109,000; n. means *near* the river the name of which follows.

Auckland 6 (Wear), South Shields 35, Gateshead 34 (Tyne), Stockton 13 (Tees), Darlington 16 (Skerne), Hartlepool 12 (E. coast).

Chester-le-Street, Wolsingham, Barnard Castle, Houghton-le-Spring.

Yorkshire.—YORK 45, Goole 6, Selby 5 (Ouse), Ripon 6 (Ure), Hull 99, Beverley 11 (Hull), Doncaster 16, Sheffield 185 (Don), Barnsley 18 (Dearne), Rotherham 8 (Rother), Pontefract 12 n., Leeds 207, Bradford 106 n., Keighley 15 (Aire), Wakefield 23, Dewsbury 18, Halifax 37 (Calder), Huddersfield 35 (Colne), New Malton 8 (Derwent), Knaresborough 5 (Nidd), Thirsk 5 (Codbeck), Scarborough 18 (east coast), Whitby 12 (Esk), Middlesborough 19 (Tees).

North and South Cave, Great Driffield, Kilham, Howden, Bingley, Skipton, Aldborough, Boroughbridge, Masham, Hawes, Leyburn, Thorne, Penninstone, Snaith, Castleford, Pocklington, Market-Weighton, Pickering, Helmsley, Kirkby, Tadcaster, Wetherby, Otley, Easingwold, Harrogate, Bedale, Richmond, Reeth, Tickhill, Bridlington, Guisborough, Settle, Stokesley, Northallerton, Sedbergh, Guiseley, Yeadon, Batley.

Lincolnshire.—LINCOLN 21, Boston 15, Spalding 7, Stamford 8 (Welland), Louth 11 (Ludd), Great Grimsby 11 (Humber), Gainsborough 7 (Trent).

Sleaford, Market-Rasen, Crowland, Bourne, Wainfleet, Spilsby, Alford, Barton, Epworth, Brigg, Caistor, Crowle, Horncastle.

Norfolk.—NORWICH 75, Yarmouth 35 (Yare), Lynn-Regis 12 (Great Ouse).

Wells, Wymondham, Hingham, Aylesham, North Walsham, Harleston, Diss, Attleborough, Thetford, Cromer, Holt, Downham-Market, Swaffham, Watton, Dereham.

Suffolk.—IPSWICH 38 (Orwell), Sudbury 7 (Stour), Lowestoft 11 (east coast), Eye 7 n. (Waveney), Bury St Edmund's 13 (Larke).

Beccles, Woodbridge, Stow-Market, Long Melford, Haverhill, Hadleigh, Framlingham, Halesworth, Bungay, Brandon, Mildenhall.

Essex.—CHELMSFORD 6 (Chelmer), Maldon 5, Saffron-Walden 6 (Blackwater), Colchester 24, Halstead 6 (Colne), Harwich 5 (Stour).

Dunmow, Thaxted, Brentwood, Coggeshall, Braintree, *Tilbury Fort*, Barking, Epping, Waltham Abbey, Romford.

TEN SOUTHERN COUNTIES.

Kent.—MAIDSTONE 23, Sheerness 12 (in the Isle of Sheppey), Chatham 36, Rochester 17, Tunbridge 6, Tunbridge Wells 14 n. (Medway), Folkestone 9 (south coast), Dover 25 (Strait of Dover), Deal 7 (east coast), Ramsgate 12, Canterbury 21 (Stour), Margate 10, Faversham 6 (north coast), Gravesend 19, Woolwich 32, Greenwich 139, Deptford 28 (Thames), Dartford 5 (Darent).

Hythe, Sandwich, Ashford, Herne Bay, Whitstable, Seven Oaks, Westerham, Sydenham, Bromley, Tenterden, Cranbrook, Milton.

Sussex.—LEWES 10 (Ouse), Chichester 8 (Lavant), Worthing 6, Brighton 78, Eastbourne 6, Hastings 23 (south coast), Midhurst 6 (West Rother), Horsham 7 (Adur).

Bognor, Little Hampton, Arundel, Petworth, Newhaven, Cuckfield, Hailsham, Rye, Battle, East Grinstead, New Shoreham.

Surrey.—GUILDFORD 8 (Wey), part of Deptford, Southwark and Lambeth (parts of London), Richmond 7, Kingston 10 (Thames), Croydon 20 (Wandle), Reigate 10 (Mole).

Godalming, Farnham, Chertsey, Epsom, Leatherhead, Dorking, Egham, Wandsworth.

Berks.—READING 25, Newbury 6 (Kennet), Windsor 10, Abingdon 6 (Thames).

Hungerford, Lambourn, Maidenhead, Wallingford, Hurst, Wokingham, Wantage, Great Faringdon.

Hampshire or **Hants.**—WINCHESTER 15, Southampton 47 (Itchin), Christchurch 9 (Hampshire Avon), Lymington 5 (the Solent), Andover 5 n. (Test), Portsmouth 95 (Portsmouth Harbour), Petersfield 6 (Rother). In the Isle of Wight are Newport 8, Cowes 5 (Medina), Ryde 9 (north coast).

Titchfield, Odiham, Ringwood, Fordingbridge, Romsey, Whitchurch, Bishop's Waltham, Fareham, Havant, Alton, Basingstoke, Kingsclere. In Isle of Wight—Osborne, Ventnor.

Wilts.—SALISBURY 12, Devizes 7 (Avon), Trowbridge 10, Malmesbury 7 (Lower Avon), Westbury 6 (Were).

Wilton, Mere, Melksham, Marlborough, Highworth, Amesbury, Warminster, Bradford, New Swindon, Calne, Chippenham.

Dorset.—DORCHESTER 7, Poole 10, Wareham 7 (Frome), Bridport 8 (Brit), Weymouth and Melcombe-Regis 11 (Wey), Sherborne 6 (Ivel).

Shaftesbury, Lyme-Regis, Blandford, Beaminster, Wimborne, Sturminster-Newton, Cranborne, Stalbridge.

Somerset.—TAUNTON 15 (Tone), Bath 53 (Lower Avon), Frome 10 (Frome), Wells 5 (Axe), Bridgewater 11 (Parret), Yeovil 8 (Yeo), Weston-super-Mare 9 (Bristol Channel).

Glastonbury, Shepton-Mallet, South Petherton, Crewkerne, Somerton, Milverton, Wellington, Milborne Port, Ilminster, Chard, Wincanton, Bruton.

Devon.—EXETER 42, Exmouth 5, Tiverton 10 (Exe), Plymouth and Devonport 113 (Plymouth Sound), Tavistock 9 (Tavy), Dartmouth 5 (Dart), Teignmouth 6, Newton Abbot 5 (Teign), Torquay 16 (Tor Bay), Barnstaple 11 (Taw), Bideford 6 (Torridge).

Topsham, Crediton, Cullompton, Totness, Ashburton, Chudleigh, St Mary Ottery, Honiton, Sidmouth, Colyton, Axminster, Ilfracombe, Hartland, South Molton, Torrington, Hatherleigh, Brixham, Dawlish.

Cornwall.—BODMIN 4 (Camel), Camborne 7, St Agnes 7, St Ives 7 (W. coast), Penzance 9 (Mount's Bay), Falmouth 6, Truro 11, Redruth 8 n. (Falmouth Harbour).

Helstone, St Just, Stratton, Marazion or Market-Jew, Penryn, St Austell, Fowey, East Looe, St Germans, Saltash, Callington, Liskeard, Launceston.

Seven Western Counties.

Monmouth.—Monmouth 6 (Wye), Newport 23 (Usk), Tredegar 9 (Ebwy).

Chepstow, Abergavenny, Usk, Pontypool.

Hereford.—Hereford 16 (Wye), Leominster 6 (Lug).

Ross, Bromyard, Kington, Ledbury.

Salop or **Shropshire.**—Shrewsbury 22, Bridgenorth 6, Much-Wenlock 20 n., Madeley 9 n. (Severn), Ludlow 5 (Teme), Wellington 6 n. (Tern), Oswestry 5 (Perry).

Market-Drayton, Shiffnal, Wem, Whitchurch, Broseley, Ellesmere, Newport, Bishop's Castle, Ironbridge, Dawley.

Cheshire.—Chester 31 (Dee), Birkenhead 52, Runcorn 10, Stockport 55, Hyde 14, Staley Bridge 25 (Mersey), Nantwich 6, Crewe 8 (Weaver), Congleton 12 (Dane), Altringham 7, Macclesfield 36 (Bollin).

Malpas, Neston, New Brighton, Middlewich, Sandbach, Knutsford, Tarporley, Bollington, Middlewich.

Lancashire.—Lancaster 16 (Lune), Ulverstone 7 (Morecambe Bay), Preston 88, Clitheroe 7 (Ribble), Blackburn 63 n., Over-Darwen 14 n., Accrington 14 (Darwen), Burnley 29, Colne 6, Paddiham 6 n. (West Calder), Wigan 38, Leigh 11 (Douglas), Chorley 15 (Chor), Ormskirk 6, Prescot 7 (Alt), Liverpool 444, Warrington 27, Ashton-under-Lyne 35 (Mersey), St Helens 18 (Sankey), Manchester and Salford 460, Bury 38, Haslingden 7 (Irwell), Oldham 94 (Medlock), Middleton 10 (Irk), Bolton 70, Farnworth 9 n., Hindley 8 (Crole), Rochdale 38, Bacup 11 (Roche), Todmorden 12 (Calder).

Dalton, Kirkham, Lytham, Fleetwood, Widnes, Blackpool, Tyldesley, Church, Fleetwood, Much-Wolton, Great Harwood, Heywood, Droylsden, Newton-in-Makerfield.

Westmoreland.—Appleby 2 (Eden), Kendal 12 (Ken).

Kirkby-Stephen, Kirkby-Lonsdale, Orton.

Cumberland.—Carlisle 29 (Eden), Penrith 7 (Eamont), Whitehaven 19 (west coast), Maryport 6 (Ellen), Workington 6, Cockermouth 7 (Derwent).

Wigton, Brampton, Longton, Keswick, Egremont, Aldstone.

Sixteen Midland Counties.

Derby.—Derby 43, Belper 10 (Derwent), Chesterfield 10 (Rother), Glossop 19 n. (Etherow).

Matlock, Bakewell, Tideswell, Buxton, Ashbourne, Wirksworth, Dronfield, Hartington, Alfreton, Clay Cross, Ilkeston.

Notts or **Nottingham.**—Nottingham 75, Newark 12 (Trent), Mansfield 8 (Idle), Worksop 7 (Ryton).

East Retford, Southwell, Bingham, Kirkby-in-Ashfield.

Stafford.—Stafford 13 (Sow), Burton-on-Trent 14, Newcastle-

under-Lyne 13, Stoke-upon-Trent 101 (Trent), Leek 10 (Churnet), Lichfield 17 n., Wednesbury 15 n., West Bromwich 17 n., Walsall 38 (Tame), Wolverhampton 61, Bilston 24 n. (Smestow).

Tamworth, Eccleshall, Rugeley, Stone, Tutbury, Uttoxeter, Cheadle, Penkridge, Cannock, Brewood.

Leicester.—LEICESTER 68, Loughborough 11, Hinckley 6 (Soar).

Melton-Mowbray, Ashby-de-la-Zouche, Market-Harborough, Lutterworth, Market-Bosworth.

Rutland.—OAKHAM 3 (Wreak), Uppingham 2 (Welland).

Worcester.—WORCESTER 31 (Severn), Evesham 5 (Upper Avon), Bromsgrove 5 (Salwarp), Kidderminster 15, Stourbridge 8, Dudley 45, Stourport 10 (Stour).

Bewdley, Upton, Droitwich, Pershore, Tenbury, Great Malvern, Halesowen, Redditch.

Warwick.—WARWICK 11, Rugby 8 (Upper Avon), Leamington 18 (Leam), Coventry 41 n. (Sow), Nuneaton 5 (Anker), Birmingham 296 (Rea).

Stratford, Alcester, Henly-in-Arden, Atherstone, Coleshill, Solihull, Sutton-Coldfield, Kenilworth, Bedworth.

Northampton.—NORTHAMPTON 33, Peterborough 12, Wellingborough 6 (Nene), Kettering 5 (Ise).

Daventry, Oundle, Rothwell, Brackley, Towcester, *Naseby*, *Fotheringay*.

Huntingdon.—HUNTINGDON 4, St Ives 3, St Neots 3 (Great Ouse).

Kimbolton, Ramsey, Godmanchester.

Cambridge.—CAMBRIDGE 26 (Cam), Ely 7 (Great Ouse), Wisbeach 9 (Nene).

March, New Market, Whittlesea.

Gloucester.—GLOUCESTER 17, Tewksbury 6 (Severn), Bristol 154 (Lower Avon), Stroud 9 (Stroud), Cheltenham 40 (Chelt), Cirencester 6 (Churn).

Thornbury, Minchin-Hampton, Lydney, Coleford, Berkeley, Wotton-under-Edge, Stow, Bisley, Tetbury, Dursley.

Oxford.—OXFORD 28 (Thames), Banbury 10 (Cherwell), Woodstock 8 (Glyme).

Henley, Bampton, Thame, Deddington, Bicester, Witney, Chipping-Norton.

Bucks or **Buckingham.**—BUCKINGHAM 4 (Great Ouse), Great Marlow 6 (Thames), Aylesbury 6 (Thame).

Eton, Olney, Newport-Pagnel, Stony Stratford, Chesham, Slough, High Wycombe, Amersham, Ivinghoe, Wendover, Princes-Risborough.

Bedford.—BEDFORD 13 (Great Ouse), Luton 15 (Lea).

Potton, Biggleswade, Leighton-Buzzard, Dunstable.

Herts or **Hertford.**—HERTFORD 7, Ware 5 (Lea), Bishop-Stortford 5 (Stort), St Alban's 8 (Colne), Hitchen 6 (Hiz).

Barnet, Watford, Hemel-Hempstead, Berkhampstead, Tring, Baldock.

Middlesex. — LONDON 2804—including the City, Westminster, Marylebone, Finsbury, Tower Hamlets, Southwark, and Lambeth—BRENTFORD, the county town, 10 (Thames).

Hounslow, Twickenham, Hampton, Staines, Tottenham, Enfield, Uxbridge, Harrow, Fulham.

TWELVE WELSH COUNTIES.

Flint.—MOLD 4 (Allen), Holywell 5, Flint 3 (Dee), Rhyl 3 (Clwyd).

Towns between 1000 *and* 2500.—Rhyddlan, St Asaph, Hawarden.

Denbigh.—DENBIGH 6, Ruthin 3 (Clwyd), Wrexham 8, Llangollen 5 (Dee), Abergele 3 (coast).

Caernarvon.—CAERNARVON 9, Bangor 7 (Menai Strait), Conway 3, Llanrwst 3 (Conway), Pwllheli 3, Llandudno 2 (coast).

Anglesea.—BEAUMARIS 3 (Menai Strait), Amlwch 3 (N. coast), Holyhead 6 (Holy I.)

Merioneth.—DOLGELLY 2 (Maw), Bala 2 (Dee).

Montgomery.—MONTGOMERY 1, Welshpool 7, Newton 6, Llanidloes 3 (Severn).

Cardigan.—CARDIGAN 4 (Teify), Aberystwith 6 (Ystwith).

Pembroke.—PEMBROKE 15, Haverfordwest 7, Milford 3 (Milford Haven), Tenby 3 (S.E. coast).

Caermarthen.—CAERMARTHEN 10, Llandeilo 5 (Towey), Llanelly 11 (S. coast).

Glamorgan.—CARDIFF 33 (Severn), Swansea 42 (Tawy), Neath 7 (Neath), Merthyr-Tydvil 50 (Taff).

Brecknock.—BRECON 5 (Usk), Hay 2 (Wye).

Radnor.—NEW RADNOR 1 (Somergill), Presteign 2 (Lugg).

Descriptive Notes.—At the last census, there were in England and Wales twelve towns having upwards of 100,000 population—(London, Liverpool, Manchester, Birmingham, Leeds, Sheffield, Bristol, Greenwich, Newcastle, Bradford, Salford, and Stoke-upon-Trent); eighteen with less than 100,000, but above 50,000—(Hull, Portsmouth, Preston, Brighton, Sunderland, Norwich, Nottingham, Oldham, Bolton, Leicester, Blackburn, Plymouth, Wolverhampton, Stockport, Bath, Birkenhead, Merthyr-Tydvil, and Devonport); forty-eight between 50,000 and 20,000, eighty between 20,000 and 10,000, and one hundred and twenty between 10,000 and 5000.

THE SEVEN EASTERN COUNTIES.

NORTHUMBERLAND, the most northern county of England, lies between the Tweed on the N. and the Tyne and Derwent on the S. Mountain limestone in the N. and W., millstone grit and the coal-measures in the S.E., extending southward to the Tees in Durham, and forming the most celebrated coal-field in the world, and the source of immense wealth to the mining and manufacturing population of the N.E. of the kingdom. The Tyne flows through the centre of this precious mineral deposit, and

the towns in its basin are all prospering. The Cheviot breed of sheep is celebrated. **Newcastle**, on the Tyne, 10 miles from its mouth, is the centre of the coal trade in the north of England, and the fifth commercial city in the kingdom; being only excelled by London, Liverpool, Bristol, and Hull. There are 50 coal-pits within a distance of 8 miles of it, yielding upwards of 3,000,000 tons annually, and large manufactories of steam-machinery and glass. It is the birthplace of the poet Akenside, and of Lord Chancellor Eldon. **Tynemouth** and **Shields** are the seaports of Newcastle. **Morpeth**, on the Wansbeck, is noted for its great cattle-market. **Berwick**, on the north side of the Tweed, famous in the annals of border warfare, was long independent of both kingdoms, and still enjoys the privileges of a county. **Otterburn**, a village of Northumberland, near which, in 1388, was fought the battle of Chevy Chase, between Percy, Earl of Northumberland, and Earl Douglas.

DURHAM, between the Tyne and the Tees: Millstone Grit, coal-measures, permian, and trias. Famous for its rich coal-deposits, and the Teeswater breed of short-horned cattle. Lead, iron, and grinding-stones are largely exported. Surface mountainous in the W., and covered with heath. A large portion of the land belongs to the bishopric of Durham. **Durham**, on the Wear, the seat of one of the four English Universities, contains a celebrated cathedral, a castle built by William the Conqueror, and has valuable collieries in the vicinity. **Sunderland**, one of the principal ports of England for the shipment of coal. Shipbuilding is extensively carried on; has an immense cast-iron bridge over the Wear, whose single arch is 237 feet in span. **Bishop-Auckland**, the residence of the Bishop of Durham, whose See was the wealthiest in the kingdom till lately, when the revenue was reduced from £22,000 a-year to £8000. **Gateshead**, a suburb of Newcastle, on the opposite side of the Tyne; a great fire in 1854 destroyed much life and property. **Stockton** and **Darlington** are united by one of the earliest constructed railways in the kingdom. **Hartlepool**—steam navigation to Hamburg, Rotterdam, Antwerp, and Scotland.

YORKSHIRE, the largest, and one of the most populous, counties of England (area 5981 sq. m., pop. 2,033,610), lies between the Tees and the Humber; consists of three divisions called Ridings (*thirds*, in Anglo-Saxon)—viz., the North, East, and West Ridings, which all meet at York. It embraces all the geological formations, in regular succession, from the mountain limestone in the W. to the chalk and tertiaries in the E. The West Riding is the chief seat of the mining and manufacturing industry of England, the coal-measures being more accessible there: its fine broadcloths and other woollen fabrics are unrivalled throughout the world: cotton, flax, and silk mills are also very numerous. The North Riding is principally oolitic, and is chiefly famous as a grazing country. The East Riding is, for the most part, cretaceous and tertiary, and comprises the hilly district called "the Wolds." **York**, on the Ouse, near the centre of the county, where the three Ridings converge, is, in point of ecclesiastical rank, the second city in the kingdom, —the Archbishop of York being the highest ecclesiastical dignitary next to the Archbishop of Canterbury; and the cathedral, called York Minster, is the finest structure of the kind in England. **Goole**, at the confluence of the Ouse and Don, and at the termination of the Aire and Calder navigation. **Selby**, the birthplace of Henry I. **Ripon**, where a conference took place between the English and Scottish Commissioners, with a view to adjust the differences between Charles I. and his Scottish subjects, in

1640. **Hull**, or Kingston-upon-Hull, is the fourth commercial city in England; in 1863, 3026 ships entered, carrying about 700,000 tons—its annual exports exceed £12,000,000 sterling, being the great outlet for the manufactures of the West Riding. **Beverly**, capital of the East Riding, contains a beautiful minster, dating from the 13th century—which, like Holyrood, has the privilege of sanctuary. **Doncaster**, on the Don, famous for its annual races. **Sheffield**, noted for cutlery and plated goods, in which it is second only to Birmingham. **Barnsley**, on the Dearne, the chief seat of the linen trade. **Rotherham**, at the confluence of the Don and Rother, has manufactures of all kinds of iron goods, including cannons, machinery, &c. **Pontefract** (Pomfret), with a famous castle now in ruins, where Richard II. died. **Leeds**, **Bradford**, **Halifax**, and **Huddersfield**, with the other towns in the basin of the Aire, are the principal seat of the woollen trade, for which the West Riding is so celebrated. Leeds alone has 106 woollen mills. **Bradford** has colleges for Baptists, Independents, and Wesleyans, and is the principal seat of the worsted-yarn manufacture. **Knaresborough**; in the vicinity is the far-famed "dropping-well," of strongly petrifying quality. **Scarborough** and **Harrogate**, famous for their mineral waters, which are highly medicinal. **Whitby**, an important seaport town, on the Esk, the birthplace of Captain Cook, the navigator.

LINCOLNSHIRE, between the Humber and the Wash, contains all the geological formations in regular succession, from the lias in the W. to the tertiary in the E. and S.; it consists of three widely different districts—viz., the *moors* in the W., the *wolds* in the N.E., and the *fens* in the S. and E. The *fens* are a part of the celebrated Bedford Level—an immense swamp partially drained two centuries ago by the Earl of Bedford, and the remainder recently by the British Government—and form the best pasture-land in England. The *wolds* are a line of chalk downs, which extends from Flamborough Head to the coast of Dorsetshire. The *moors* are now mostly cultivated. **Lincoln**, the capital, on the Witham, is noted for its beautiful cathedral, which contains a gigantic bell called Tom of Lincoln. At the time of the Conquest, the Witham was navigable for large vessels up to the town, and Lincoln formed then one of the principal seaports in the kingdom. **Boston** has a fine church, with a tower that serves as a lighthouse for the navigation of the Wash. **Spalding** was a place of some consequence even in Saxon times. **Stamford** and **Louth** send large quantities of corn to London. **Great Grimsby** has a fine harbour and extensive docks. **Gainsborough**, on the Trent, with considerable inland trade, exports hardware and manufactured goods.

NORFOLK, between the Wash and the Waveney.—Principally cretaceous, but tertiary in the E.; coast-line low, surface level; soil, a light sandy loam, well fitted for barley and turnips, which constitute the principal crops: extensive manufactures of woollen and silk fabrics; great numbers of turkeys and geese are reared for the London market. **Norwich**, on the Yare, the finest city in the E. of England, was the birthplace of Dr Samuel Clarke and of Archbishop Parker, long famous for its worsted manufactures, first introduced by the Flemings in the sixteenth century, and now for its bombasines and crape; has a huge cathedral, with a spire 315 feet high. **Yarmouth**, also on the Yare, noted for its herring-fishery, the most important in England, and for its roadstead, lying between the coast and a dangerous sandbank in the vicinity. **Lynn-Regis**, or King's-Lynn, on the Great Ouse, here 1000 feet broad.

SUFFOLK, between the Waveney and the Stour.—Chalk in the W., tertiary in the E.; surface level, and soil well cultivated, producing wheat,

barley, beans, oats, turnips, hemp, and hops. **Ipswich**, with extensive iron and soap manufactures, is the birthplace of Cardinal Wolsey. **Sudbury**, on the Stour, sent two members to the House of Commons, but was lately disfranchised for bribery. **Lowestoft**, the most eastern town in the British Isles. **Bury St Edmund's** has a large corn and cattle market, which lasts for three weeks.

ESSEX, between the Stour and the Thames.—Almost wholly tertiary; surface flat and marshy in the S., but richly wooded and beautifully diversified in the centre and N.; soil rich, and famous for its wheat crops. **Chelmsford**, at the confluence of the Chelmer and Cann, and on the Great Eastern Railway. **Maldon** exports fish and agricultural produce. **Saffron-Walden**, so named from the *saffron* plant, formerly cultivated here. **Colchester**, on the Colne, crossed here by seven bridges, famous for its oyster-fisheries. **Halstead**, with manufactures of silks, velvets, satins, and straw-plait. **Harwich** has the finest harbour on the east coast of England, and steam communication with Rotterdam.

THE TEN SOUTHERN COUNTIES.

KENT, between the Thames and the Rother.—Tertiary in the N., chalk and greensand in the centre and E., and the wealden, a fresh-water deposit, in the S.; surface hilly—two small ranges traverse the county from W. to E.—but the S. low and level, containing Romney Marsh and "the Weald;" soil and climate excellent, and agriculture in a highly advanced state, with products more varied than any other English county; wheat, barley, and hops of very superior quality, and numerous orchards of cherries, plums, and filberts. **Maidstone**, on the Medway, the chief seat of the hop trade. **Sheerness**, **Chatham**, **Woolwich**, and **Deptford**, with royal dockyards and arsenals. **Tunbridge Wells**, with medicinal waters, a fashionable resort for the Londoners. **Hythe**, **Dover**, **Romney**, and **Sandwich**, four of the five Cinque Ports (Hastings in Sussex being the fifth). **Folkestone**, the birthplace of Harvey, the discoverer of the circulation of the blood. **Dover**, on the Strait of Dover, is only 21 miles from the French coast, and is the chief point of communication between England and the Continent. **Deal**, near the Goodwin Sands, maintains a numerous staff of pilots for steering vessels through the Downs. **Ramsgate**, **Margate**, and **Gravesend**, convenient resorts for the population of London. **Canterbury**, the ecclesiastical cap. of England, was a place of some importance in the time of the Romans, and afterwards the cap. of the Saxon kingdom of Kent. The Archbishop of Canterbury is the primate of England, and, after the royal family, ranks as the first peer of the realm. **Greenwich** is celebrated for its naval hospital, and its royal observatory, from which the longitude on all British maps and charts is reckoned.

SUSSEX ("South Saxons"), between the Rother and Chichester Harbour. The wealden in the N. and E., greensand, chalk, and tertiary in the W. and S.; surface diversified; "the Weald" is level, moderately fertile, and from time immemorial famous for its forests; the South Downs—a range of chalk hills—traverse the cretaceous portion from W. to E., terminating at Beachy Head. South of the Downs there is a considerable tract of fertile soil belonging to the tertiary formation. Climate mild, and harvests early, but agriculture in a rather backward state; hops extensively raised in the E. The breeds of cattle and sheep are in high repute. **Chichester**, on the Lavant, in the S.W. of the county, occupying a fine situation at the foot of the South Downs, is the birthplace of

William Collins. **Brighton**, a romantic and beautiful town, the gayest of English watering-places, with an extensive marine promenade. **Hastings**, the principal of the Cinque Ports, the scene of a famous battle, in 1066, between Harold II., the last Saxon king, and William the Conqueror. **Lewes**, where Simon de Montfort and the barons defeated Henry III. in 1264.

SURREY, between Sussex and the Thames.—Weald in the S., greensand and chalk in the centre, and tertiary in the N. The North Downs run from W. to E.; the W. largely covered with heath, but fertile soil in the tertiary part. A large portion under tillage, and hops extensively raised; another large portion laid out as kitchen-gardens, for supplying the metropolis with vegetables; woods extensive, but agriculture backward. **Guildford**, on the Wey, and 17 miles from London, has considerable traffic in corn, malt, and coals. **Deptford**, partly in Kent, with large naval arsenal and dockyards. **Southwark** and **Lambeth** now form parts of London; in the latter is Lambeth Palace, the residence of the Archbishop of Canterbury. **Richmond**, with a celebrated park, is the burial-place of Thomson the poet, and of Kean the tragedian. **Kingston**, where the first armed force in the Parliamentary war assembled.

BERKS, between Hampshire and the Thames. Coral-rag in the N., greensand and chalk in the centre, and tertiary in the S. A tract of chalk downs extends through the centre; Windsor forest and park in the E.; soil fertile; agriculture backward; manufactures unimportant, but extensive trade in agricultural produce. **Reading**, the birthplace of Archbishop Laud. **Windsor**, celebrated for its palace and park; the former, the most magnificent regal palace in the kingdom, was founded by the Conqueror, and is the favourite residence of the sovereign; the latter, containing Windsor Forest, is 56 miles in circumference.

HANTS, chiefly included between Chichester Harbour and the Hampshire Avon. Chalk in the N., tertiary in the S. The North and South Downs traverse the county, and the south coast is deeply indented; for the most part well wooded, with extensive forests of oak and birch; soil good, and generally well cultivated, producing excellent hops; its cider and bacon in high repute. The Isle of Wight, which is tertiary in the N. and greensand and weald in the S., is considered the garden of England. **Winchester** was long the capital of England; here many of the Saxon princes are interred. **Southampton**, the entrepôt for some of the greatest ocean steam lines in the world: here the mails are made up and despatched to the East and West Indies, China, and the Mediterranean. **Andover**, one of the largest cattle-markets in England. **Portsmouth**, the headquarters of the British royal navy, with extensive dockyards and arsenal; the harbour unequalled in the kingdom, and the fortress considered impregnable. **Newport**, the capital of the Isle of Wight.

WILTS, N.W. of Hants and S. of the Thames. Oolitic in N. and W., cretaceous in the S. and E. The centre is occupied by the elevated tableland of Salisbury Plain, in which nearly all the rivers of the county rise; soil highly fertile, especially in the extreme N. and S., but the central plateau produces only scanty herbage; the most remarkable objects here are the far-famed Druidical remains of Stonehenge and Avebury, on which much antiquarian research has been expended. **Salisbury**, with a magnificent Gothic cathedral; the spire, the highest in Britain, rises to a height of 404 feet. **Devizes**, **Bradford**, **Trowbridge**, **Chippenham**, and **Westbury**, have extensive manufactures of woollens and fine cloths. **Amesbury**; near it are Stonehenge, and Milston Rectory, the birthplace of Addison.

DORSET, on the English Channel, for the most part between the Hampshire Avon and the Lyme.—Cretaceous in the E., and oolitic in the W. Surface level in the N., but traversed by chalk hills in the centre, where numerous flocks of sheep find pasture. Dairy produce highly important, and large commerce in Portland and Purbeck stone, coarse marble, and potter's clay. **Dorchester**, a place of great antiquity, with the remains of a huge Roman amphitheatre. **Poole**, a large seaport, largely engaged in the Newfoundland fishery. **Bridport**; shipbuilding, cordage, fishing-nets, and sailcloth. **Sherborne**, the birthplace of Sir W. Raleigh.

SOMERSET, between Dorset and the Bristol Channel.—Greatly diversified, and embracing all the formations from the old red to the oolite. Coast-line and surface irregular; the Mendip and Quantock hills divide the county into three divisions; fertile along the rivers, and there dairy husbandry is pursued with great success, but in other parts there are extensive wastes, as Exmoor in the W. Coal, calamine, iron, lead, and fuller's earth are obtained: the principal manufactures are woollens, silks, linens, paper, glass, and iron-wares. Many antiquities. **Taunton**, where Judge Jeffreys held the bloody assize after the battle of Sedgemoor. **Bath**, on the Lower Avon, long the most fashionable watering-place in the kingdom, is one of the most beautiful cities in Europe. **Frome**, long noted for its ale. **Wells**, with a noble cathedral, erected in the thirteenth century. **Bridgewater**, the birthplace of Admiral Blake, is noted for its high tides. **Weston-super-Mare**, from an insignificant village, has risen into a favourite watering-place.

DEVON, between the English and Bristol Channels.—The centre and W. carboniferous, and the seat of some of the most valuable mines in England, especially copper and tin; the S. and extreme N., Devonian; New red and greensand in E.; surface greatly broken, but generally fertile, except Exmoor and Dartmoor. The climate in winter is very mild, the average temperature being 44°. Most kinds of grain are raised, and the county is famed for its cider. The red Devon breed of cattle is highly valued. Herring, pilchard, mackerel, and dory fisheries important. **Exeter**, a fine old town with a beautiful cathedral, and the birthplace of the poet Gay. **Plymouth** and **Devonport**, closely contiguous, are principal stations of the royal navy; noted for a naval arsenal, and for a stupendous breakwater which cost £1,200,000. **Tavistock**, the birthplace of Sir Francis Drake, and of William Browne the poet. **Torquay** (Torkeé), on Tor Bay, the resort of numerous invalids. **Barnstaple** has considerable trade in timber with Canada and the Baltic.

CORNWALL, in the extreme S.W. of the kingdom.—Devonian for the most part, interspersed with igneous rocks, but carboniferous in the N.E.; surface rugged; soil indifferent; scantily timbered; climate mild, salubrious, but very humid. Its tin mines are the most celebrated in the world, and have been wrought from remote antiquity. The metalliferous district extends from Dartmoor, in Devonshire, to Land's End; but the richest mines are in the S.W. of the county. Copper is also abundant; and lead, silver, zinc, iron, manganese, antimony, cobalt, and bismuth exist in many localities. **Bodmin**, on the Camel, engaged in the manufacture of coarse woollen stuffs. **Camborne**, **Redruth**, and **Marazion**, with valuable copper-mines. **St Ives** and **St Agnes**, famous for their unrivalled tin mines. **Penzance**, **Truro**, and **Launceston**, are called the "Stannery towns," being those to which the miners carry their blocks of tin, in order to be stamped by Government agents. **Falmouth**, a favourite resort of our fleets in time of war, and a mail-packet station.

The Seven Western Counties.

Monmouth, between the Wye and the Rumney.—Devonian for the most part, but carboniferous in the extreme W. and E.; surface picturesquely varied with hill and dale, and finely wooded; coal, ironstone, and limestone abundant; flannel the chief manufacture; many British and Roman remains; the Welsh language and manners prevalent; and in general the county may be considered as rather Welsh than English. **Monmouth**, on the Wye, the birthplace of Henry V., and of Geoffrey of Monmouth the annalist; with extensive manufactures of bar-iron, tinplates, and paper. **Newport** exports coal, iron, and tin, which are conveyed hither from South Wales; large trade in shipbuilding and iron-foundries. **Tredegar**, noted for its coal-mines and ironworks.

Hereford, in the basin of the Severn.—Almost wholly Devonian; surface beautifully diversified, and presenting some of the finest scenery in England, especially in the S.W., and in the Malvern Hills; soil fertile and admirably adapted for agriculture; climate remarkably healthy; apples, hops, and oak bark are important articles of commerce; and the breeds of sheep and cattle are celebrated for their excellence. **Hereford** (Her'-e-ford) on the Wye, the birthplace of David Garrick, the comedian, and of Nell Gwynn, the favourite mistress of Charles II. **Leominster** (Lem'-ster), famed for the quality of its cider, and for manufactures of leather, gloves, hats, and woollen.

Salop, in the basin of the Severn.—Silurian strata, containing lead mines in the S.W., new red sandstone, with rock-salt, in the N., and Devonian beds and coal in the remainder; surface mountainous in the S., comparatively level in the N.; fine meadow-lands near the Severn; hops and orchards in the S., coal and iron in the E., lead in the W., and salt in the N. The manufactures are, china ware, flannels, carpets, linen, gloves, and paper. A good deal of cheese is made, and large flocks of turkeys are reared. **Shrewsbury**, on the Severn, where a bloody engagement took place, in 1403, between the troops of Henry IV. and the Percies, in which Hotspur was killed. **Bridgenorth**, extensively engaged in the carpet manufacture. **Broseley**, noted for its iron-foundries (known as the Colebrookdale works); a suspension-bridge over the Severn here was the first erected in England; near it is **Colebrookdale**, famous for its petroleum or tar springs.

Cheshire, a maritime county between the Mersey and the Dee.—Nearly all of new red sandstone, containing an inexhaustible supply of rock-salt; surface level, well wooded, and studded with many small lakes; soil, clay or sandy loam; climate moist. The county is noted for its dairy produce, and especially for its cheese. Coal, copper, lead, rock-salt, and cobalt are among its mineral products, and the principal manufactures are cottons and silks. **Chester**, on the Dee, exports cheese in large quantities, and is the burial-place of Matthew Henry the commentator, and of the poet Parnell. **Birkenhead**, a new town on the estuary of the Mersey, opposite Liverpool, fast rising into importance. **Stockport** has coal abundant in the vicinity, and large manufactures of cotton, silk, machinery, brass, and iron goods. **Staley Bridge**, extensively engaged in the cotton manufacture. **Macclesfield** employs 10,000 hands in silk-weaving. **Crewe**, on the London and North-Western Railway, is a great railway depôt.

Lancashire, a maritime county between the Mersey and Morecambe Bay.—Mainly carboniferous, but new red sandstone in the W., lined

with post-tertiary deposits; mountainous in the N. and along the E. border, elsewhere generally level; climate mild but very humid; pasture-lands more extensive than the arable; potatoes extensively cultivated, and horticulture largely pursued. Copper, ironstone, and lead ore prevail extensively; but the county owes its celebrity, wealth, and population to its manufactures and commerce. It is the grand seat of the cotton manufacture, which has increased since 1770 with a rapidity altogether unparalleled in the history of industry. Woollen, flax, and silk factories are also numerous. During the last hundred years the population (now 2,429,440) has increased eightfold. A complete network of railways, and several important canals, afford means of rapid conveyance to all parts of the kingdom. **Lancaster**, on the Lune, with a superb aqueduct over the river. **Liverpool**, a large and flourishing city, and the second commercial port in the kingdom, is situated on the estuary of the Mersey, about four miles from its mouth, and 32 miles from Manchester, with which it is connected by railway. It carries on a vast maritime trade, especially with the United States, importing thence cotton wool, and exporting cotton cloth. In 1869, 23,938 ships entered and cleared the port, with a tonnage of 9,277,714 tons. In 1860, before the American war began, the cotton imported into Liverpool amounted to 1,417,000,000 lb. Liverpool is the chief outlet for the manufactures of Lancashire, Staffordshire, and the west of Yorkshire. **Manchester**, on the Irwell, across which it communicates by six bridges with **Salford**, which may be regarded as its suburb; united population, 460,000. It is the great centre of the cotton manufacture, and probably the greatest manufacturing city in the world. The other principal "cotton towns" in the county are **Preston, Blackburn, Burnley, Wigan, Chorley, Ashton-under-Lyne, Oldham, Bury, Middleton, Bolton, and Rochdale.**

WESTMORELAND, between the Pennine Hills and Morecambe Bay, is only very partially a maritime county.—Cumbrian strata in the W., silurian in the centre, carboniferous in the E., and Permian in the N.; a country of mountains, lakes, and picturesque scenery; climate humid; soil various, and agriculture improving; cattle of large size, sheep numerous, their wool being sent to the Yorkshire woollen manufactories; great flocks of geese raised for exportation; slate is quarried in great quantities, as also granite, marble, copper, and lead; char, and other lake fish, extensively exported. **Appleby**, on the Eden; the castle held out long against the Parliamentary army under Oliver Cromwell. **Kendal**, on the Ken, one of the oldest manufacturing towns in the kingdom; its cloths, manufactured by Flemish weavers, were famous in the time of Richard II.

CUMBERLAND, a maritime county in the extreme N.W., between the Pennine chain and the Irish Sea. An extensive area of Cumbrian strata in the S., with igneous rocks interspersed; carboniferous, Permian, and triassic in the centre and N.; surface rugged and mountainous, interspersed with beautiful lakes, presenting the most magnificent scenery in England. Climate extremely moist: Seathwaite, where 183 in. of rain fell in 1861, and at the Stye 224 in. in 1866, are perhaps the rainiest districts in Europe. In consequence of this extreme moisture, agriculture is chiefly confined to stock-breeding; and green crops attain to great perfection, especially Swedish turnips. Principal minerals are silver, copper, lead, iron, and coal. Near Whitehaven are extensive beds of coal and hæmatite, and at Borrowdale there is a mine of plumbago. The chief manufactures are cottons, coarse linens, checks, and woollens; and the lakes yield abundance of char, trout, pike, and perch. **Carlisle**, an episcopal

see on the Eden, surrendered to the Highland army under Prince Charles, in 1745. **Penrith** has manufactures of cotton, linen, and woollen goods. **Whitehaven** exports great quantities of coal, and of the iron-ore called hæmatite: the coal-mines extend a long way under the sea. **Maryport** and **Workington** have considerable trade in coal. **Cockermouth**, the birthplace of the poet Wordsworth. **Keswick** manufactures black-lead pencils from the plumbago mines of Borrowdale. Here Southey the poet spent his last years and died.

The Sixteen Midland Counties.

Derby, a central county in the basin of the Trent. Chiefly carboniferous, but new red sandstone in the S. Surface mountainous in the N., where the Pennine range terminates in the Peak of Derby; elsewhere level. The Peak district abounds in romantic scenery, in natural curiosities, and in lead-mines. Climate bracing and salubrious; soil reddish clay or marl in the S., where grain and great quantities of cheese are produced. The county is singularly rich in minerals; coal, lead, iron, gypsum, marble, and fluor-spar are wrought to a great extent. Collieries and ironworks numerous; principal manufactures, silk, cotton, metallic goods, and porcelain. **Derby**, on the Derwent, at the extremity of a coal-field, and on the Midland Railway, is favourably situated for manufactures and trade—noted for its silks, porcelain, marble and fluor-spar ornaments. **Belper**, with large cotton factories and potteries. **Chesterfield**, lace and silk manufactures; with mines of iron, coal, and lead in the vicinity. **Glossop**, near the Peak of Derby, is the chief seat of the cotton manufacture in the county. **Matlock** and **Buxton**, celebrated for their mineral waters. **Wirksworth**, with an extensive and valuable lead-mine, is regarded as the mining capital of Derbyshire.

Notts, a central county in the basin of the Trent. Coal and Permian in the W., lias in S.E., and millstone grit in the remainder. Surface diversified; climate remarkably dry, probably owing to the Derbyshire hills intercepting the moist S.W. winds; soil either clayey or light and sandy; agriculture well advanced; minerals abundant, especially coal and limestone. It is the principal seat of the cotton hosiery, and of lace-manufactures. **Nottingham**, on the Trent, is the great centre of the lace manufacture. **Newark**, where Charles I., after his defeat at Naseby, surrendered himself to the Scottish army. **Mansfield**, manufactures of cotton hosiery and lace, and a large trade in malt. **Worksop**, in a district called "The Dukery," a number of noblemen having their mansions here.

Stafford, a central county in the basins of the Trent and Severn. Principally carboniferous, but new red sandstone in the centre; surface level in the centre, hilly in the S., moorland in N.E. Climate chilly, owing to the elevation; much rain in some parts; two-thirds of the surface cultivated, but farming less important than the mining operations, in which this county holds the third rank in England. There are two very valuable coal-fields, one in the N., called the pottery coal-field, owing to the great number of potteries that have been established on it; and the other in the S., called the Dudley coal-field, celebrated for the thickness of its seams of coal, and for the excellence and richness of its iron ores. Besides coal, the most important mineral product is the pottery clay, which has made the county so celebrated for its earthenware. **Stafford**, on the Sow, the birthplace of Isaac Walton. **Burton-on-Trent**, famous for its ales, has a bridge over the river reckoned the

longest in England, with thirty-seven arches. **Newcastle-under-Lyne**, noted for its hats—near it **Etruria**, the famous pottery establishment of Josiah Wedgwood. **Stoke-upon-Trent**, **Hanley**, and **Burslem**, with some other towns in the vicinity, are called "The Potteries," owing to their immense manufacture of earthenware. **Lichfield**, the birthplace of Samuel Johnson. **West Bromwich**, **Walsall**, and **Bilston**, with great ironworks. **Wolverhampton**, noted for its hardware manufactures.

LEICESTER, an inland county in the basin of the Trent. Some coal in the W.; new red, with igneous rocks, in the centre, and lias in the E. Surface undulating—a fine grazing county, noted for its sheep, horses, and cattle, and for Stilton cheese. It is the principal seat of the woollen hosiery manufacture. The principal minerals are coal, iron, and lead. **Leicester** (Les'-ter), on the Soar, the principal seat of the woollen hosiery manufacture. **Loughborough**, hosiery of all kinds. **Hinckley**, cotton and worsted stockings.

RUTLAND, the smallest county in England (area 152 sq. m.), in the basins of the Trent and Welland. Lias in the western half, and oolite in the eastern. Surface undulating and diversified with parks; the eastern half chiefly under tillage, and western half under pasture; soil everywhere loamy and rich; great attention is paid to the rearing of sheep and oxen. **Oakham** manufactures silk shag for hats. **Uppingham**, a small town on the Welland.

WORCESTER, in the basin of the Severn. New Red in W., lias in centre, and oolite in the E.; some coal found in N. Surface generally level, but having the Malvern Hills in S.W., and the Bredon Hills in S.E. Soil fertile, well watered, and richly wooded; wheat and hops extensively raised, and orchards numerous. Principal minerals are coal, found at Dudley, building-stone, and clay. The New Red at Droitwich contains brine-springs. Manufactures, carpets, glass, ironware, gloves, porcelain, needles, and fish-hooks. **Worcester** (Woos'-ter), on the Severn, a handsome and very ancient city, noted for its porcelain, reckoned the finest in England. **Kidderminster**, producing the finest carpets in England. **Stourbridge** has manufactures of glass and earthenware. **Dudley**, in the "Black Country," has a famous coal-field, part of which has been on fire for a century; is one of the principal seats of the iron trade. **Stourport** is the seat of a busy trade in corn, coal, and timber.

WARWICK, in the basins of the Severn and Trent. Lias in S., new red in the centre, carboniferous and Permian in the N. Surface elevated, and diversified by gentle hills and vales; climate mild and salubrious; soil generally very fertile and well cultivated, and a great part of it in permanent pasture. The most valuable minerals are coal, limestone, sandstone, blue flagstone, and marl. Manufactures very important, especially hardware, arms, watches, jewellery, silk, and ribbons. **Warwick** (Wor'-ric), on the Upper Avon. The castle, once the residence of the Earl of Warwick, is the most complete specimen of a feudal fortress in the kingdom. **Stratford**, also on the Avon, the birthplace of the immortal Shakespeare. **Rugby**, with a celebrated school, the scene of Dr Arnold's labours, stands in the exact centre of England. **Leamington** (Lem'-ington), a fashionable watering-place, with sulphureous, saline, and chalybeate springs. **Coventry** and **Nuneaton**, the chief seat of the ribbon manufacture. **Birmingham**, on the Rea, an affluent of the Tame, and a sub-tributary of the Trent, is the second manufacturing city in England, and for hardwares the first in the world. It has been called "the great toy-shop of Europe," but it is equally famous for all descriptions of hardware, firearms, and crown-glass. It is surrounded by extensive coal-

pits and iron-works, and is one of the main centres of canal and railway communication in England. Here electro-plating was invented; and at Soho in the vicinity is the greatest manufactory of steam-engines in the world, conducted by a firm of which the celebrated James Watt was a partner.

NORTHAMPTON, a central county, drained by the Nen, Welland, and Ouse. Almost wholly oolite and lias. Surface diversified and richly wooded; soil mostly a stiff productive loam; climate healthy; agriculture well advanced, the chief staple being the breeding of heavy black horses, short-horned cattle, and sheep; chief manufactures—shoes, bobbin-lace, and woollen stuffs. **Northampton**, on the Nen, the chief seat of the boot and shoe manufacture. **Peterborough**, an episcopal see, the birthplace of Dr Paley; the cathedral, a splendid edifice, contains the tomb of Queen Catharine, first wife of Henry VIII. **Wellingborough**, with boot, shoe, and lace manufactures. **Kettering**, silk-weaving, plush, and wool-combing. **Naseby**, a country parish, 12 miles N.N.W. of Northampton; here in 1645 the troops of Charles I. were totally defeated by the Parliamentary army. **Fotheringay**, 3½ miles N.N.E. of Oundle; its castle is famous as the birthplace of Richard III., and as the scene of the imprisonment, trial, and execution, in 1587, of Mary Queen of Scots.

HUNTINGDON, sometimes called Hunts, an inland county in the basin of the Ouse. Almost wholly oolitic, but post-tertiary in N.E. Surface gently varied where the oolite prevails, the rest level, and forming a part of "The Fens." Climate mild and healthy, except in the fens; soil good and almost wholly under cultivation, with agriculture in an advanced state, especially in the Bedford Level or fens district; horses extensively bred, and much "Stilton cheese" made. Manufactures unimportant. **Huntingdon**, on the Great Ouse, the b.-place of Oliver Cromwell in 1599; has extensive breweries, and considerable trade in corn, wool, coals, and timber. **St Ives**, large sheep and cattle markets.

CAMBRIDGE, in the basins of the Great Ouse and Nen. Post-tertiary in the N., oolitic in the centre, greensand and chalk in the S. and E. Surface level, marshy, and thinly wooded, and the fens liable to inundation; about a third of the county under tillage, the rest forming excellent pasture. The butter of Cambridge and Epping, and the cheese of Cottenham, are highly valued; but, on the whole, agriculture is rather backward, and the houses of the peasantry wretched: with the exception of some pottery-ware, there are no important manufactures. **Cambridge**, on the Cam, is the seat of a celebrated university, founded in the seventh century, and consisting of sixteen colleges and one hall. It is principally renowned for mathematics and natural philosophy. **Ely**, a bishop's see, with a splendid cathedral—the only episcopal city in England which sends no member to Parliament. **Wisbeach**, an active river port, engaged in shipbuilding.

GLOUCESTER, in the basin of the Severn. Principally oolite and lias, but carboniferous and new red in the W.; naturally divided into three divisions—viz., the valley of the Severn in the middle, the Cotswold Hills in the E., and the forest of Dean in the W. The first is highly fertile, and the scenery beautiful; the second is celebrated for its sheep-farming. The county is chiefly agricultural, but it is also noted for its cheese, which is nowhere surpassed. The principal minerals are coal and iron; and the manufactures chiefly woollen and cotton cloth. **Gloucester** (Glos'-ter), a bishop's see, on the Severn, has a fine cathedral, and manufactures of cutlery, soap, and pins. **Tewkesbury**, the scene of a decisive battle between the houses of York and Lancaster in 1471. **Bristol**, on

the Lower Avon, is the third seaport in England, and the commercial metropolis of the west. The fine flannels of Wales are finished here; extensive iron and brass foundries; the birthplace of many eminent persons, among whom William of Worcester, Sebastian Cabot, Chatterton, Bayley, and Southey. **Stroud**, on a river of same name, the water of which is peculiarly adapted for dyeing scarlet, is the centre of the Gloucester wool-manufacture. **Cheltenham**, with its saline medicinal springs, is the rival of Bath as a watering-place. **Cirencester**, (Sis'-e-ter), a very ancient town, had some importance in the time of the Romans. **Berkeley**, the birthplace of Dr Edward Jenner, the discoverer of vaccination.

OXFORD, in the Thames basin. Principally oolite and lias, but greensand and chalk in the S.E.; surface mostly level or undulating, except in the S., where it is traversed by the Chiltern Hills; soil a fertile loam in the N., elsewhere gravelly; four-fifths of the county under cultivation; stock of sheep large; dairy produce excellent; minerals unimportant; manufactures—lace, gloves, and blankets. **Oxford**, on the Cherwell, with a celebrated university consisting of nineteen colleges and five halls, principally renowned for classical learning; annual revenue, £457,000. The Bodleian library contains 220,000 printed, and 20,000 MS. volumes. Oxford formed the headquarters of Charles I., and the scene of the martyrdom of Cranmer, Ridley, and Latimer. **Banbury**, noted for its cheese, and for cakes, which bear its name. **Woodstock**, celebrated for its gloves; gives name to one of Scott's novels: near it Blenheim, the magnificent seat of the Duke of Marlborough.

BUCKS, in the basins of the Great Ouse and Thames. Oolite in the N., greensand and chalk in the S.; surface undulating in the N., occupied by the Chiltern Hills in the S.,* and in the centre by the rich vale of Aylesbury, one of the most fertile in the kingdom; well wooded; yields large quantities of butter and cheese, with sheep and poultry—the sheep being noted for the weight and fineness of their fleeces; minerals of little importance, but manufactures considerable, consisting of paper, straw-plait, and thread-lace. **Buckingham**, on the Great Ouse, which nearly surrounds it, has manufactories of paper and bobbin-lace; near it is **Stowe**, the splendid residence of the Duke of Buckingham. **Eton**, the seat of the most famous school in England, founded by Henry VI. in 1440. **Great Marlow**, silk, lace, and paper. **Aylesbury**, in the centre of the county, has a better right than Buckingham to be regarded as the county town.

BEDFORD, in the basin of the Great Ouse. Oolite in the N., greensand and chalk in the S.; surface level, except around the Chiltern Hills in the S.; soil various, from the stiffest clay to the lightest sand; chiefly under tillage, but agriculture not in an advanced state; culinary vegetables extensively cultivated in the sandy and chalky districts for the London and Cambridge markets; onions and cucumbers of the best quality are extensively raised; minerals unimportant; and the manufactures chiefly consist of straw-plait for hats, reckoned but little inferior to that brought from Tuscany, and of pillow-lace. **Bedford**, on the Great Ouse, noted for its straw-plaiting; near it **Elstow**, the birthplace of John Bunyan; and **Cardington**, where John Howard resided. **Luton, Biggleswade, Leighton-Buzzard**, and **Dunstable**, all extensively engaged in the straw-plait and straw-hat manufacture.

* The office of Steward of the Chiltern Hundreds, though now a sinecure, is still retained, to enable members of the House of Commons to vacate their seats by accepting it, as it is unconstitutional for members to demit their office more directly.

HERTS, in the basins of the Thames and Great Ouse. Nearly all cretaceous, but tertiary in the S.; soil various, often intermixed with flint, and of average fertility; principal crops—wheat, barley, turnips, apple and cherry orchards; minerals of no importance; principal manufactures—paper and straw-plait; much malting is carried on. **Hertford** (Har'ford) on the Lea; near it Haileybury College, where, till 1858, young men were trained for the service of the East India Company. **Ware**, at the head-springs of the New-River, which supplies the north of London with water. **St Albans**, an ancient town, was the scene of two battles between the rival houses of York and Lancaster in 1455 and 1461; the church contains the remains of the celebrated Lord Bacon.

MIDDLESEX, in the Thames basin. Wholly tertiary, being the lower eocene or London clay, which consists of a tenacious brown or bluish-grey clay replete with fossils, especially at Highgate Hill, near London; surface almost perfectly level, except the slight eminences of Hampstead, Highgate, and Harrow-on-the-Hill; soil various; agriculture in a backward state, but improving; grass-farms, for the supply of London with hay and milk, greatly exceed in extent the arable portion; market-gardens extensive, and a large portion occupied by villas, commons, and pleasure-grounds; minerals of no importance, except clay for brick-making. **London**, on the Thames, the capital of England, and the metropolis of the British empire, is probably the largest, and certainly the wealthiest and most commercial city in the world. Population (in 1869), 3,170,754; occupying a surface of 122 sq. m. This immense population is nearly equal to that of the entire kingdom of Scotland, and exceeds the aggregate population of the 15 next largest towns in England. The population doubles itself in about 40 years. There are 900 churches and chapels, 250 public and 1500 private schools, 150 hospitals, 156 almshouses, 250 other institutions of a similar character, 550 public offices, 14 prisons, 22 theatres, 24 markets, 100,000 establishments of trade and industry, besides an immense number of public-houses, hotels, eating-houses, and beer-shops. The foreign exports in 1860 amounted to £30,837,000, and the imports to £80,000,000; customs revenue, £12,000,000. In 1869, 40,102 ships entered and cleared the port, of 10,529,068 tons burden. There are six bridges across the Thames—viz., London, Southwark, Waterloo, Westminster, Blackfriars, and Vauxhall bridges; three railway bridges, and two tunnels under the bed of the river—one two miles below London Bridge, and the other (opened in 1870) at the Tower. The most conspicuous public buildings are St Paul's Cathedral (a noble structure of Grecian architecture, 510 feet long, 250 broad, with a dome 370 feet high); the Mansion House; the Bank; Royal Exchange; General Post-Office; India, Custom, and South-Sea Houses; Mint; Christ's and Bartholomew's Hospitals; Westminster Abbey; Houses of Parliament; British Museum; University College and Hospital; Somerset House; St James's and Buckingham Palaces. Among its principal scientific associations are the Royal Society, Royal Antiquarian, Linnean, Horticultural, Medical and Chirurgical, Geological, Geographical, Astronomical, Asiatic, Zoological, Ethnological, and Statistical Societies. There are 12 daily newspapers, and 130 others, with 500 other periodicals. Breweries and distilleries are on an immense scale; but Southwark and Lambeth are the great workshops, with large iron-works, tanneries, breweries, glass-works, patent shot and steam-engine manufactories. Silk-weaving is confined to Spitalfields; watch-making chiefly to Clerkenwell; shipbuilding to Wapping, Rotherhithe, Deptford, and Blackwall; cutlery of the finest quality is produced in many parts. In

Druidical times **Londinium** was first the capital of the Cantii, and afterwards of the Trinobantes. It was called **Augusta** in Roman times, and was the central point from which all the Roman roads in Britain diverged. After the departure of the Romans, it was the capital of the East Saxons till A.D. 871, when it became the capital of England under Alfred the Great. It obtained its first royal charter from William the Conqueror in the eleventh century; in 1665 the great plague cut off 100,000 of the inhabitants, and one year afterwards it was nearly all destroyed by fire. The other towns in Middlesex are of little importance. **Fulham** is the site of the palace of the Bishop of London. **Brentford**, the nominal capital of the county Middlesex. **Chelsea**, 4½ miles from St Paul's, noted for its hospital for superannuated soldiers.

The Twelve Welsh Counties.

Flint, a maritime county in the N.E., bounded by the Dee and Clwyd. Chiefly carboniferous, with a patch of new red in the N.W. Surface level in the N., and elsewhere diversified by a range of hills running from S. to N. Soil fertile in the low grounds, and but only partially under tillage. Its lead-mines are the most valuable in the empire, and those of copper and coal of great importance. Manufactures, cotton and some flannel. **Mold**, on the Allan, a small town, with coal and lead mines. **Holywell**, with rich copper and lead mines; the well, which gives the town its name, is the most copious spring in Britain, giving out twenty-one tons of water per minute. **Flint** exports coal and lead, and imports timber.

Denbigh, a maritime county, between the Clwyd and the Conway. Silurian for the most part, but carboniferous and new red on the east border; surface rugged and mountainous; soil fertile in the valleys, but in the hilly districts consisting of peat covered by heath, and affording pasture to great numbers of sheep, goats, and black cattle. Principal minerals—coal, lead, iron, flint, and slates; manufactures—stockings, flannels, coarse woollen cloth, gloves, and shoes. **Denbigh**, on the Clwyd, with manufactories of tanning, shoemaking, and woollen plaids. **Wrexham**; paper-mills, flannel manufactories, coal and lead mines. **Llangollen**, with a noble aqueduct across the Dee for the Ellesmere Canal; it has fifteen arches, and is 126 feet high; a castle of great antiquity. **Abergele**, a resort for sea-bathing.

Caernarvon, a maritime county, between the Conway and the Irish Sea. Silurian; surface the most mountainous in South Britain, being traversed by the Snowdon range, 3590 feet high; but many tracts of low and fertile land, affording excellent pasturage. The chief branch of rural industry is dairy produce and the rearing of cattle and sheep. Its slate-quarries are the most valuable in Britain; other minerals are copper and lead. **Caernarvon**, on the Menai Strait, exports slate and copper ore; has an ancient castle erected by Edward I. to secure his conquest of Wales. **Bangor**, also on the Menai Strait, with two stupendous viaducts, each of which is a triumph of engineering skill. One of these is a huge suspension-bridge, 560 feet long, with the roadway 100 feet above high-water mark, erected by Telford; the other, the Britannia Tubular Bridge, Stevenson's greatest achievement, forming a part of the Chester and Holyhead Railway, consisting of two lines of iron tubes, each 1513 feet long, supported on three towers, and 100 feet above the sea-level. **Llanrwst** contains the tomb of Llewellyn, the last prince of Wales belonging to the Celtic race.

ANGLESEA, an insular county in the N.W. Chiefly Silurian, but Devonian and carboniferous in the centre, surface comparatively flat; climate mild, but unfavourable to the growth of timber; soil fertile and well cultivated; manufactures insignificant; minerals—copper, lead, and silver ores, coal, marble, and granite. Many Druidical remains. **Beaumaris**, a fine town on the Menai Strait, much frequented as a bathing-place. **Amlwch** exports copper obtained from the Parys and Mona mines. **Holyhead**, connected with Kingston and Dublin by a submarine telegraph 70 miles long.

MERIONETH, a maritime county between Caernarvon and the Dovey. Wholly Silurian; surface mountainous, well wooded, with fine vales and many small lakes; soil poor, and only fitted for pasture-lands; Welsh ponies, called "Merlins," are reared; minerals, slates and lime, with some lead and copper; manufactures, coarse flannels; considerable shipping. **Dolgelly**, on the Gwynion, near its junction with the Maw; it came into possession of the famous Owen Glendower, during his rebellion in 1400. **Bala**, on the lake of same name, the largest in North Wales, has some manufactures of flannels.

MONTGOMERY, an inland county in the basin of the Severn. Wholly Silurian; surface mountainous and well wooded, a small portion under tillage, the rest occupied with sheep-walks; the sheep are celebrated for their mutton and wool. Here also the famous "Merlins," a pure breed of Welsh ponies, are reared. The principal mineral is slate, and the chief article of manufacture is flannel. **Montgomery**, on the Severn, the scene of the last struggle between the Welsh and the English in 1294. **Welshpool**, considered the capital of North Wales, has tanneries and woollen-mills. **Newton**, with manufactures of flannels. **Llanidloes**, where Llewellyn was defeated by Edward I.

CARDIGAN, a maritime county between the Dovey and Teify. Strata Silurian; surface level on the coast, where the ground is highly fertile; mountainous in the interior; scarcely one-third under cultivation; principal industry, rearing cattle; minerals—slates, silver, copper, and lead; manufactures, gloves and flannels. **Cardigan**, on the Teify, exports slates, oats, and butter. **Aberystwith**, a gay bathing-place; large export trade to Liverpool.

PEMBROKE, a peninsular county in the S.W. Silurian in the N., Devonian and carboniferous in the S.; mountainous in the Silurian tract, but tame elsewhere; coast bold and deeply indented; climate mild and very rainy; soil everywhere fertile, but chiefly used as pasture; minerals—anthracite, coal, lead, lime, slate, and marl; manufactures unimportant, but fisheries valuable. **Pembroke**, on Milford Haven, with a Government dockyard, and a castle stormed by Oliver Cromwell. **Haverfordwest** (Harfurdwest), on the Cleddy, has a great local trade. **Tenby**, on the south coast, a favourite watering-place; commodious and well-sheltered harbour.

CAERMARTHEN, the largest county in Wales, lying chiefly in the basin of the Towey. Silurian in N., Devonian and carboniferous in the S.; surface hilly, with numerous fertile valleys, and well wooded; the uplands afford pasture to herds of small cattle; minerals—iron, lead, coal, and lime; manufactures, tinned iron-plates and other articles. **Caermarthen**, on the Towey, one of the most flourishing towns in Wales; has a Presbyterian college, docks, and large export trade in lead, slates, bark, corn, and butter. **Llandeilo** has rich coal and iron mines, stanneries, and manufactures of flannel. **Llanelly**, with several docks and copper-works, and a large export trade in coal.

GLAMORGAN, the most important county in the principality, situated on the British Channel, between the rivers Burry and Rumney. Nearly all carboniferous; surface mountainous in the N., level elsewhere; soil highly fertile; minerals—inexhaustible quantities of coal and iron, both of which are wrought on an immense scale. The coal-field is the largest, and the iron-mines the most important, in the empire. **Cardiff**, at the confluence of the Taff and Severn, is rapidly becoming one of the first ports in the empire; splendid docks, with 45 acres water-area, give great facilities for shipments. **Swansea** is fast rising in importance: the copper ore of Anglesea, Cornwall, and Ireland is smelted and refined here. **Neath**, with iron and copper foundries and coal-mines. **Merthyr-Tydvil**, the largest town in Wales; though recently a small village, it has now a population of 50,000. This prosperity is owing to its position near the centre of the great coal-field of South Wales; numerous iron-foundries and coal and iron mines.

BRECKNOCK, an inland county in the basin of the Severn. Silurian in N. and W., all the rest Devonian; surface mountainous—the Beacon, which is the loftiest mountain in South Wales, rises to a height of 2862 feet; soil various, and only about a half cultivated, producing oats, barley, wheat; the remainder in pasture, yielding wool, butter, and cheese; minerals—copper, lead, iron, coal, and limestone, most of which are extensively wrought; manufactures, worsted hosiery and coarse woollen cloth. **Brecon**, on the Usk, has extensive markets and a considerable general trade: it is of high antiquity, and was the birthplace of Mrs Henry Siddons in 1755.

RADNOR, an inland county in the basin of the Severn. Wholly Silurian; surface mountainous, except in the S.E.; staple products, sheep of a small hardy breed, and cattle. Much of the surface is covered with bog and moorland, the ancient forests of Radnor having long since disappeared. **New Radnor**, once a fortified town, is now a mere village.

Capes.—Flamborough Head and Spurn Head, E. of Yorkshire; Gibraltar Point, E. of Lincoln; Lowestoft Ness, in Suffolk, the most eastern point in Great Britain; the Naze in Essex; N. Foreland, S. Foreland, and Dungeness, in Kent; Beachy Head and Selsea Bill in Sussex; Dunnore Head and the Needles in Isle of Wight; St Alban's Head and Portland Point in Dorset; Start Point in Devon; Lizard Point in Cornwall, the southernmost point of Great Britain; Land's End, the most westerly point of England; Hartland Point in N. of Devon; Worms Head in W. of Glamorgan; St Goven's Head and St David's Head in Pembroke; Brach-y-Pwll, the most western point of North Wales; Holyhead in Anglesea; St Bees Head in Cumberland.

Islands.—Holy I. or Lindisfarne, Ferne Is., and Coquet I., on the E. of Northumberland; Sheppey and Thanet in estuary of the Thames; Isle of Wight, S. of Hants; the Channel or Norman Isles—viz., Jersey, Guernsey, Alderney, and Sark—on the N.W. coast of France, capital, *St Helier*, the seat of the local Parliament, and the most southern town in the British Isles, pop. 30,000; Scilly Isles, 140 in number, off Land's End; Lundy Island, at the entrance of Bristol Channel; Stockham, Skomer, and Ramsey, W. of Pembroke; Bardsey, off Brach-y-Pwll Head; Anglesea and Holyhead, a county in N.W. of Wales; Isle of Man, a large and populous island in the middle of the Irish Sea.

Bays and Straits.—Humber Mouth, bet. York and Lincoln; the Wash, bet. Lincoln and Norfolk; Yarmouth Roads, E. of Norfolk; estuary of the Thames, bet. Essex and Kent; the Downs, bet. Kent and the Goodwin Sands; Strait of Dover, bet. Dover and Calais, 21 miles broad; Portsmouth Harbour, Spithead, Southampton Water, and the Solent, S. of Hants; Pool Bay and Weymouth Bay, S. of Dorset; Tor Bay, Start Bay, and Plymouth Sound, S. of Devon; St Austell Bay, Falmouth Harbour, and Mount's Bay, S. of Cornwall; St Ives Bay, W. of Cornwall; Bideford Bay, N. of Devon; Bristol Channel, bet. Somerset and Wales; Swansea Bay and Caermarthen Bay, S. of Wales; Milford Haven, St Bride's Bay, Cardigan Bay, and Caernarvon Bay, W. of Wales; Menai Strait, bet. Caernarvon and Anglesea; St George's Channel, bet. Wales and Ireland, 40 miles broad; estuaries of the Dee and Mersey, on either side of Cheshire; Lancaster Bay and Morecambe Bay, in the N.W. of Lancashire; Solway Firth, bet. Cumberland and Scotland.

Mountain System.—England is far from being a mountainous country. Strictly speaking, there is only one mountain-range of moderate elevation in the whole country. This range, commencing with the mountains on the Scottish border, pursues a southerly course through Derbyshire to Gloucestershire, and then deflects westward till it terminates at Land's End in Cornwall. The position of this lengthened and nearly continuous chain is a fine example of the well-known law that mountain-ranges follow the direction of the greatest length of land in which they are situated. This range is about 500 miles long, has few interruptions, and forms the main water-parting of England. Here nearly all the large rivers have their origin; and by this range, and the lateral branches which proceed from it on both sides, the direction of the rivers and the extent of the river-basins are determined. As it lies much nearer to the western than to the eastern side, the great majority of the rivers have an easterly direction. However, as there is a considerable gap about the middle of the range, and as two important rivers (the Trent and the Upper Avon) intersect it in opposite directions in that depression, it is more convenient to consider the two portions as separate and independent ranges. Then the mountains of Wales will rank as a third range; and the lateral ranges that branch off in an easterly direction, the fourth and last.

1. The **Northern Range**, extending from the extreme N. of England to the Peak of Derby in the centre of the kingdom, embraces three different chains—viz., the Cheviot Hills, the Pennine Chain, and the Cumbrian Mountains. The *Cheviot Hills* extend about 35 miles bet. Northumberland and Roxburgh shires, and form the water-parting bet. the basin of the Tweed on the one side, and those of the Aln, the Wansbeck, and the Tyne on the other—highest summit, Cheviot Peak, 2688 feet. The *Pennine Chain* is a continuation of the Cheviots, extending from their western extremity to the Peak of Derby, 270 miles; and forming the great water-parting of the North of England: it sends to the North Sea the Tyne, Wear, Tees, Yorkshire Ouse, and the left affluents of the Trent (Dove, Derwent, Idle, and Tarn); and to the Irish Sea, the Eden, Lune, Ribble, and Mersey. Principal summits, Cross Fell (2901), Bow Fell (2911), In-

gleborough (2361). The *Cumbrian Mountains*, in Cumberland, though an offshoot from the principal chain, contain the loftiest mountains in England proper. They are separated from the Pennine Chain by the Eden flowing northward, and by the Lune flowing southward—sending to the Irish Sea the Ehen, Esk, and Dudden, the Leven, Ken, and Lune, and containing the celebrated lakes which are the favourite resort of the English tourist. Principal eminences—Scawfell, 3229, the highest mountain in England; Helvellyn, 3055; Skiddaw, 3022.

2. The **Devonian Range** extends from the S.E. of Worcestershire, through Gloucester, Somerset, Devon, and Cornwall, and terminates at the Land's End in the extreme S.W. of the kingdom. It forms the principal water-parting of the south of England, separating the great basin of the Severn, with its continuation the Bristol Channel, from the rivers that flow to the E. and S.—viz., the right-hand affluents of the Trent, those flowing into the Wash, the Thames with its tributaries, and those which find their way to the English Channel, Its different parts receive particular names. Thus: The *Bredon Hills*, in the S.E. of Worcester, 900 feet; the *Cotswold Hills*, in Gloucester, 1134 feet; the *Mendip Hills*, in the N.E. of Somerset, 1000 feet; the *Quantock Hills*, in the N. of Somerset, 1428 feet; *Exmoor* and *Dartmoor*, in Devon, where the range attains its maximum elevation in Caws and Beacon, 1792 feet; the *Cornish Mountains*, in Cornwall, where Brown Willy rises to a height of 1364 feet.

3. The **Cambrian Range**, of very irregular form, occupies the greater part of the principality of Wales. Properly speaking, it forms an offshoot from the Pennine range, and the continuity of the water-parting bet. the two chains can be easily traced. It consists of two parallel ranges, one along the north coast of Wales, the other along the south, with a connecting-bar between their centres, running N. and S.—the whole forming a figure like an inverted capital I. The *northern range* contains the highest mountain in South Britain—viz., Snowdon in Caernarvon, 3590 feet, the culminating-point of England and Wales. The *central chain*, at right angles to it, contains Cader Idris, 2950, Plynlimmon, 2463, in Merioneth; and the *southern chain* has Brecknock Beacon, in Brecknockshire, 2862 feet, and the *Malvern Hills*, in Herefordshire, 1396 feet high. These last closely approach the Cotswold Hills in the Devonian range, on the opposite side of the Severn, a river which rises in Plynlimmon, and derives its head-waters and right-hand tributaries from the Cambrian range, which is therefore the connecting-link between the Pennine and Devonian ranges. In general this range forms the water-parting between the Severn and Bristol Channel on the one side, and the Irish Sea on the other. The Dee, Clwyd, and Conway flow to the N., the Dovey, Ystwith, and Teify to the W., all into the Irish Sea; the Towey, Tawy, and Taff, into the Bristol Channel; the Rumney, Usk, and Wye, into the Severn.

4. The **Lateral** or **Secondary Branches** are of no great elevation; but as they play an important part in the direction of the rivers, and determine the dimensions of the river-basins, they require special attention. Nearly all of them proceed in an easterly direction from the Devonian range. The first branches off from the Cotswold Hills in a north-eastern direction, separating Warwick and Leicester from Oxford, Northampton, and Rutland; it terminates in the N.W. of Lincoln, and divides the basin of the Humber and Trent from that of the Wash. The second diverges from the Devonian range at Salisbury Plain, in Wiltshire, and pursues a north-eastern course till it arrives at the N. coast of Norfolk: it bears different names in different parts, as the *Chiltern Hills* in Oxford and Bucks, the *Gogmagog Hills* in Cambridgeshire, and forms the water-

parting between the basins of the Wash and the Thames. The third consists of a double range of chalk-hills, called the *North* and *South Downs*, setting out from Salisbury Plain, and terminating, the one at Folkestone, and the other at Beachy Head. They enclose the district called "The Weald," and divide the Thames basin from the English Channel.

River-Basins.—There is a necessary connection between the mountain-chains, as above enumerated, and the more or less extended valleys or river-basins lying between them. As the principal mountain-range runs from N. to S., and is situated much nearer to the W. than to the E. coast, it follows that all the larger rivers have an easterly direction. The Severn, even, which is the only exception to this rule, pursues an easterly direction for a great part of its course; and were it not for the obstacle interposed by the Cotswold Hills, which deflect it westward, it would find its way to the Thames, and empty itself into the German Ocean.

Of the 100 river-basins of England and Wales, only 20 have any considerable magnitude. These occupy three-fourths of the entire surface, and contain 41 out of the 52 capitals. Only four of these basins are very extensive—viz., the Humber, the Wash, the Thames, and the Severn. Their combined area is reckoned at 30,000 sq. m., or more than half the entire surface, and they contain 28 capitals of counties. The first three slope towards the North Sea, and the fourth towards the Atlantic.

Of these four basins, that of the **Humber** and **Trent** is the largest, being one-sixth of the entire kingdom (area, 9550 sq. m.) It forms a quadrilateral figure, the longest side of which extends from the W. of Warwickshire, a little S. of the town of Birmingham, to the N. frontiers of Yorkshire; on the W. side, opposite Morecambe Bay, it approaches within 22 miles of the coast. It consists of three parts—viz., the basin of the Humber proper, 1178 sq. m.; of the Trent, 4082 sq. m.; and of the Yorkshire Ouse, 4290 sq. m. It is bounded on the N. by the basin of the Tees, on the W. by those of the Ribble and Mersey, on the S.W. by that of the Severn, and on the S.E. by the basin of the Wash. The **Basin of the Wash** is of an irregular form, consists of the subordinate basins of the Great Ouse, Nen, Welland, and Witham, and is bounded on the N. and N.W. by the Humber basin, on the W. by the Thames and Severn basins, on the S. and S.E. by the Thames and Yare basins: area, 5850 sq. m. The **Thames Basin** is bounded on the N. by those of the Wash and Blackwater; on the W. by the Severn basin, from which it is separated by the Cotswold Hills; and on the S. by the slope which inclines towards the English Channel: area 6160 sq. m. The **Severn Basin** commences at Plynlimmon, about 13 miles from the W. coast; is bounded on the N. by the basins of the Dee and Mersey; on the E. by those of the Humber and Thames; on the W. by the small streams that enter Cardigan Bay; and on the S.W. by those that flow into the Bristol Channel. As this Channel, however, is in reality only the estuary of this river, the real southern boundary is the Devonian range: area, 8580 sq. m.

Table of Rivers and Towns.—The following table, the result of much labour and research, presents in one connected view all the rivers and towns of England and Wales possessing the least degree of importance.

No fewer than 100 main rivers and 200 tributary streams are enumerated

in the left-hand column; while in the other will be found 800 towns, amounting to or exceeding 1000 inhabitants, including 350 large towns of 5000 inhabitants and upwards. The rivers are given in the order in which their mouths would occur to one sailing round the coast from the Solway Firth to the Tweed; and the towns and tributary rivers in the order in which he would observe them in his passage up the river. Main rivers, or those entering the sea, are placed to the extreme left, as the Sark, Eden, and Wampool; tributaries, or rivers of the second rank, one place further to the right, as the Caldew, Irthing, and Eamont; sub-affluents, or affluents of tributaries, two places to the right, as the Chor, Medlock, and Irk. The letter *l* denotes that the affluent after which it stands enters the main river on the *left;* those without any affix enter on the *right* side. Capitals of counties are distinguished by SMALL CAPITALS; towns of 5000 inhabitants and upwards, by Roman letters; and those between 1000 and 5000 by *Italics*. B. denotes *bay*; Co., *coast;* Hr., *harbour;* and Sd., *sound*.

Basins inclined to the Irish Sea.

Rivers.	*Towns.*
Sark,	*Gretna Green*, on the boundary.
Esk,	*Longtown*, *Langholm*.
Liddel, *l*	*New Castleton*.
Eden,	CARLISLE, APPLEBY, Kirkby-Stephen.
Caldew, *l*	Carlisle.
Irthing,	*Brampton*.
Eamont, *l*	Penrith.
Wampool,	*Wigton*.
Poebeck,	Whitehaven.
Ellen,	Maryport.
Derwent,	Workington, Cockermouth, *Keswick*.
Ehen,	*Egremont*.
Morecambe	Ulverstone, *Dalton*, n., Bay, Cartmell, n.
Leven and L.	Hawkshead, n.
Windermere,	
Ken or Kent,	Kendal.
Lune,	LANCASTER, Kirkby-Lonsdale, *Sedbergh*.
Dent, *l*	*Dent*.
Wyre,	*Fleetwood*.
Ribble,	*Kirkham*, Preston, Clitheroe, *Settle*.
Douglas, *l*	Wigan, Leigh.
Chor,	Chorley.
Darwen, *l*	Blackburn, n., Over-Darwen, n., Accrington, n.
W. Calder, *l*	Burnley, Colne, Padiham, n.
Alt,	Ormskirk, Prescot.
Mersey and	Liverpool, Birkenhead,
Tame,	*Much Wolton*, n., Runcorn, Warrington, *Newton-in-Makerfield*, n., Stockport, Hyde, Ashton-under-Lyne, Staley Bridge.
Weaver, *l*	Frodsham, Crewe, n., Nantwich.
Dane,	*Middlewich*, Congleton.
Sankey,	Warrington, *Newton*, n., St Helens.
Bollin, *l*	Altringham, *Bollington*, n., Macclesfield.
Irwell,	Manchester, Salford, Bury, Haslingden, *Heywood*, n., *Droylsden*, n.
Medlock, *l*	Oldham.
Irk, *l*	Middleton.
Crole,	Bolton, Tarnwarth, n., Hindley, n.
Roche, *l*	Rochdale, Todmorden, n., Bacup, n.
Goyt, *l*	Stockport.
Etherow,	Glossop, n.
Dee,	Holywell, Flint, *Hawarden*, n., *Neston*, CHESTER, Wrexham, n., *Malpas*, n., Llangollen, *Corwen*, *Bala*.
Allen, *l*	MOLD.
Clwyd,	Rhyl, *Rhyddlan*, *St Asaph*, DENBIGH, *Ruthin*.
N. Co. Denbigh,	*Abergele*.
Conway,	*Conway*, *Llanrwst*.
Menai Straits,	BEAUMARIS, Bangor, CAERNARVON.
Co. of Anglesea	Amlwch, Holyhead.
Co. of Caernar-von,	*Nevin*, Pwllheli, Llandudno.
Maw,	*Barmouth*, DOLGELLY, n.
Gwynion, *l*	Dolgelly.
Dovey,	*Machynlleth*.
Ystwith,	Aberystwith.
Teify,	CARDIGAN, *Lampeter*, *Tregaron*.
Co. Pembroke,	*Newport*, *Fishguard*, Tenby.
MilfordHaven,	Milford, PEMBROKE, Haverfordwest, *Narberth*.

Basins inclined to the Bristol Channel.

Rivers.	*Towns.*
Taff, ...	*Laugharne.*
Towey, ...	CARRMARTHEN, Llandeilo, *Llangadock, Llandovery.*
Caermarthen Bay,	*Kidwelly*, Llanelly.
Tawy, ...	Swansea.
Neath, ...	Neath.
Afon, ...	*Aberavon.*
Ogmore, ...	*Bridgend.*
Severn, ...	CARDIFF, *Chepstow*, n., *Berkeley*, n., *Lydney*, GLOUCESTER, Tewkesbury, *Upton*, Malvern, Stourport, *Bewdley*, Bridgenorth, *Broseley*, Much-Wenlock, n., Madeley, n. SHREWSBURY, Welshpool, MONTGOMERY, Llanidloes.
Axe, ...	*Axbridge*, Wells.
Taff, ...	CARDIFF, Merthyr-Tydvil.
Ely, ...	*Llantrissent.*
Usk, ...	Newport, *Abergavenny*, BRECON.
Ebwy, ..	Tredegar, n.
A f o n - Lilwyd,	*Pontypool.*
Lower Avon, *l*	Bristol, Keynsham, Bath, *Bradford*, Trowbridge, *Melksham*, Chippenham, Malmesbury.
Lr. Frome,	Bristol, Chipping-Sodbury.
Frome, *l*..	Frome, *Bruton*, n.
Were, *l* ..	Westbury.
Marden, *l*	*Calne.*
Wye, ...	*Chepstow, Coleford*, MONMOUTH, Ross, HEREFORD, *Hay, Builth*, Rhayader.
Lugg, *l* ..	Leominster, Presteign, NEW RADNOR, n.
Frome, *l*	Bromyard.
Arrow,	Leominster, Kington.
Somergill,	NEW RADNOR.
Berkeley Avon,	*Berkeley, Wotton-under-Edge.*
Frome, *l* ..	Stroud.
Stroud ...	*Minchin-Hampton.*

Rivers.	*Towns.*
Leddon, ...	GLOUCESTER, Newent, *Ledbury.*
Chelt, *l*	Cheltenham.
Upper Avon,	Tewkesbury, *Pershore*, Evesham, *Stratford*, WARWICK, Rugby.
Arrow, ..	*Alcester*, Redditch.
Alne, *l*	Henley-in-Arden.
Leam, ...	WARWICK, Leamington.
Sow, ...	Coventry, n., *Bedworth.*
Swift, ...	Rugby, *Lutterworth.*
Teme, ...	WORCESTER, n., *Tenbury*, Ludlow, *Knighton.*
Salwarp, *l* ..	*Droitwich*, Bromsgrove.
Stour, *l*	Stourport, Kidderminster, Stourbridge, *Halesowen*, Dudley, n.
Smestow, *l*	Wolverhampton, Bilston, n.
Warf, *l*	Bridgenorth, *Shifnal*, Dawley.
Tern, ...	Wellington, n., *Market-Drayton.*
Roden, ..	*Wem, Whitchurch*, n., *Ellesmere*, n.
Mees, *l* ..	*Newport.*
Perry, *l*	Oswestry.
Vyrnwy, *l* ..	*Llanfair.*
Cain, *l* ..	*Llanfyllin.*
Brue, ...	*Glastonbury, Shepton-Mallet, Castlecarey, Brunton.*
Parret, ...	Bridgewater, *Langport, S. Petherton, Crewkerne, Beaminster.*
Carey, ...	*Somerton.*
Tone, *l*	TAUNTON, *Milverton*, n., *Wellington.*
Yore or Ivel,	*Langport*, Yeovil, Sherborne.
Isle, *l*	*Ilminster, Chard.*
Bristol Channel,	*Dunster, Ilfracombe, Hartland.*
Taw, ...	Barnstaple, *Chumleigh.*
Mole, ...	S. Molton.
Torridge, ...	Bideford, *Torrington.*
Bude, ...	*Stratton.*
Camel, ...	*Padstow*, BODMIN.
W. Co. Cornwall	Camborne, n., St Agnes, St Ives, *St Just.*

Basins inclined to the English Channel.

Mount's Bay, ..	Penzance, *Marazion, Helstone*, n.
Falmouth Hr.	Falmouth, *Penryn*, Truro, Redruth, n.
S. Co. Cornwall	*St Austell.*
Fowey, ...	*Fowey, Lostwithiel.*
Looe, ...	*East Looe, Liskeard.*
Plymouth Sd. .	Plymouth, Devonport, *St Germans, Saltash.*
Lynher, ...	*St Germans, Callington.*
Tavy, ...	Tavistock.
Tamer, ...	*Saltash, Launceston, Holsworthy*, n.

Basins inclined to the English Channel (continued).

Rivers.	*Towns.*
Dart,	Dartmouth, *Totness, Ashburton.*
Tor Bay,	*Brixham*, Torquay.
Teign,	Teignmouth, *Newton-Abbot, Chudleigh, Moreton-Hampstead.*
Exe,	Exmouth, *Topsham*, Exeter, Tiverton, *Dulverton.*
Crede,	*Crediton.*
Otter,	*St Mary, Ottery, Honiton.*
Sid,	*Sidmouth.*
Axe,	*Colyton, Axminster.*
Lyme,	Lyme-Regis.
Bride or Brit,	Bridport, *Beaminster.*
Wey,	Weymouth.
Poole Harbour and Frome,	Poole, *Corfe Castle*, n., Wareham, Dorchester.
Hampshire Avon,	Christchurch, *Ringwood*, Fordingbridge, Salisbury, *Amesbury*, Devizes.
Stour,	Christchurch, *Wimborne, Blandford, Sturminster, Shaftesbury.*
Allen, *l*	*Cranbourne.*
Cayle, *l*	*Stalbridge, Wincanton.*
Wily,	Salisbury, *Wilton, Warminster.*
The Solent,	Lymington.
Southampton water,	Southampton.
Aire, *l*	*Titchfield.*
Hamble, *l*	*Bishop's Waltham.*
Itchin, *l*	Southampton, Winchester, Alresford.
Test,	*Romsey*, Andover, n., *Whitchurch.*
Portsmouth H.	Portsmouth, *Fareham.*
Chichester Hr. & R.	*Havant*, Chichester. Lavant,
Sussex Co.,	*Bognor*, Worthing, Brighton, Eastbourne, Hastings.
Arun,	*Little Hampton, Arundel.*
W. Rother,	*Petworth*, Midhurst, *Petersfield.*
Adur,	*New Shoreham*, Horsham
Ouse,	*Newhaven*, Lewes, *Cuckfield*, n.
Rother,	*Rye, Battle*, n.
Crane, *l*	*Tenterden*, n., *Cranbrook*
S. Co. Kent,	Hythe, Folkestone.
E. Co. Kent,	Dover, Deal.

Basins inclined to the North Sea.

Stour,	Ramsgate, *Sandwich*, Canterbury, Ashford.
N. Co. Kent,	Margate, *Herne Bay, Whitstable*, Faversham, *Milton*, n.
Thames,	Sheerness, Gravesend, Woolwich, Greenwich, Blackwall, Deptford, London, Fulham, Brentford, Richmond Twickenham, Kingston, Hampton, *Chertsey, Staines, Eton*, Windsor, *Maidenhead, High Wycombe*, Great Marlow, Henley, Reading, n., *Wallingford*, Abingdon, Oxford, *Bampton* n., *Gt. Farringdon*, Cirencester, n.
Medway,	Sheerness, Chatham, *Strood*, Rochester, Maidstone, Tunbridge, Tunbridge Wells, n., East Grinstead, n.
Darent,	Dartford, *Seven Oaks, Westerham.*
Pym, or Bourne, *l*	*Romford.*
Roding, *l*	Barking, *Epping*, n.
Lea, *l*	Blackwall, Tottenham, n., Enfield, n., *Waltham Abbey*, Ware, Hertford, Luton.
Stort, *l*	Bishop's Stortford.
Ravensbourne,	Deptford, Bromley.
Wandle,	*Wandsworth*, Croydon.
Brent,	*Brentford.*
Hogsmill,	Kingston, *Epsom.*
Mole,	*Leatherhead, Dorking*, Reigate.
Wey,	Guildford, *Godalming, Farnham, Alton.*
Bourne,	*Chertsey, Chobham.*
Colne, *l*	*Staines, Uxbridge, Watford*, St Albans.
Misbourne,	*Amersham.*
Chess,	Chesham.
Vorlan,	St Albans, *Hemel-Hempstead*, n., *Berkhamstead*, n.
Wick, *l*	Great Marlow, *High Wycombe.*
Loddon,	*Henley*, n., *Hurst*, Basingstoke, *Kingsclere*, n.
Kennet,	Reading, Newbury, *Hungerford, Marlborough.*
Lambourne, *l*	Newbury, *Lambourn.*

Basins inclined to the North Sea (continued).

Rivers.	*Towns.*
Thame,	*Thame*, Aylesbury, *Tring*, n., *Ivinghoe*, n.
Ock,	Abingdon, *Wantage*, n., Highworth, *Swindon*.
Cherwell, *l.*	Oxford, Banbury.
Ray, *l.*	Bicester
Evenlode, *l.*	*Charlbury*.
Glynn, *l.*	Woodstock.
Windrush, *l*	*Witney*.
Churn, *l.*	Cirencester.
Blackwater,	Maldon, *Witham*, *Coggeshall*, Saffron-Walden, n.
Chelmer,	Chelmsford, *Dunmow*, *Thaxted*.
Cann,	Chelmsford, *Brentwood*, n.
Podsbrook.	*Witham*, Braintree.
Colne,	Colchester, Halstead.
Stour,	Harwich, Sudbury, *Long Melford*, *Haverhill*.
Bret, *l.*	*Hadleigh*.
Orwell,	Ipswich, Stow-Market.
Deben,	*Woodbridge*.
Alde,	*Orford*, *Framlingham*.
Blyth,	*Southwold*, *Halesworth*.
Suffolk Co,	Lowestoft.
Yare,	Yarmouth, Norwich, Windham, n.
Bure, *l.*	Aylsham.
Ant, *l.*	North Walsham.
Waveney,	Beccles, *Bungay*, *Harleston*, Eye, n., *Diss*.
Taes,	Norwich, *Attleborough*, n.
N. Co. Norfolk,	*Cromer*, *Wells*.
Cley,	*Holt*.
Great Ouse,	Lynn-Regis, *Downham-Market*, Ely, *St Ives*, Huntingdon, *Godmanchester*, n., *St Neots*, Bedford, *Olney*, *Newport-Pagnel*, *Stony-Stratford*, Buckingham, *Brackley*.
Nar, or Setchy,	Lynn-Regis, *Swaffham*, n.
Stoke,	*Downham-Market*, n., *Watton*.
Lit. Ouse,	Brandon, *Thetford*.
Larke,	*Mildenhall*, Bury St Edmund's.
Cam,	*Newmarket*, n., Cambridge, Saffron-Walden.
Ivel,	*Potton*, n., *Biggleswade*.
Hiz,	Hitchin.
Ouzel,	*Leighton-Buzzard*, *Dunstable*, n.
Tow,	*Towcester*.
Nene,	*March*, *Ramsey*, Wisbeach, *Whittlesea*,

Rivers.	*Towns.*
Nene—*continued.*	*Crowland*, Peterborough, *Oundle*, Wellingborough, Northampton, *Daventry*, *Naseby*, n.
Ise,	Kettering, *Rothwell*.
Welland,	*Holbeach*, n., Spalding, *Crowland*, Stamford, *Uppingham*, n. *Market-Harborough*.
Glen,	*Bourne*.
Witham,	Boston, Lincoln, *Grantham*.
Sleaford,	*Sleaford*.
Bain, *l.*	*Horncastle*.
Langworth, *l*	*Market-Rasen*.
Steeping,	*Wainfleet*, *Spilsby*.
Withern,	*Alford*, n.
Humber and Trent,	Great Grimsby, Hull or Kingston, *Barton*, *North and South Cave*, *Epworth*, Gainsborough, Newark, *Southwell*, n., *Bingham*, n., Nottingham, Burton, *Rugeley*, *Stone*, Longton or Lane End, Newcastle-under-Lyne, Stoke-upon-Trent, Hanley, Shelton, Burslem.
Ludd,	Louth.
Hull, *l*	Kingston or Hull, Beverley, *Great Driffield*, *Kilham*.
Ancholm,	Glanford Brigg, *Caistor*, n.
Ouse & Ure,	Goole, *Howden*, Selby, York, all on the Ouse; *Aldborough*, *Boroughbridge*, Ripon, *Masham*, *Hawes*.
Don,	*Thorne*, Doncaster, Rotherham, Sheffield, *Pennistone*.
Dearne,	Barnsley.
Rother,	Rotherham, *Dronfield*, n., Chesterfield.
Aire,	*Howden*, n., *Snaith*, Pontefract, n., Leeds, Bradford, n., *Bingley*, Keighley, *Skipton*.
Calder,	*Castleford*, Wakefield, *Batley*, n., Dewsbury, Huddersfield, n. Halifax, Todmorden.
Derwent, *l*	*Pocklington*, n., Newmalton, *Pickering*, n.
Rye,	*Helmsley*, *K. Moorside*, n.
Wharfe,	*Tadcaster*, *Wetherby*, *Guiseley*, n., *Yeadon*, *Otley*.
Foss, *l.*	York, *Easingwold*, n.

Basins inclined to the North Sea (continued).

Rivers.	*Towns.*
Nidd,	Knaresborough, *Harrogate.*
Swale, *l*	*Bedale*, n., *Richmond, Reeth.*
Cod-beck, *l*	Thirsk.
Wiske, *l*	*Northallerton.*
Old Don, *l*	*Crowle, Tickhill.*
Idle, *l*	*E. Retford*, Mansfield.
Ryton, *l*	Worksop.
Devon,	Newark, *Bingham.*
Erwash, *l*	*Ilkeston, Alfreton, Kirkby-in-Ashfield.*
Soar,	Loughboro', LEICESTER, Hinckley.
Wreak,	*Melton-Mowbray*, OAKHAM.
Derwent, *l*	DERBY, Belper, *Matlock.*
Wye,	*Bakewell, Tideswell, Buxton.*
Dove, *l*	*Tutbury*, Uttoxeter, Ashbourne, *Hartington.*
Churnet,	*Cheadle*, Leek.
Schoo, *l*	*Ashbourne, Wirksworth.*
Mease,	*Ashby-de-la-Zouch.*
Tame,	Lichfield, n., *Tamworth*, Wednesbury, n., West Bromwich, n., Walsall.
Anker,	*Atherstone*, Nuneaton.
Blithe,	*Coleshill, Solihull.*
Rea,	Birmingham.
Sow,	STAFFORD, Eccleshall.
Penk,	*Penkridge, Cannock, Brewood.*
Yorkshire Co.,	Bridlington, Scarborough.
Esk,	Whitby.
Tees,	Middlesborough, *Guisborough*, n., Stockton, *Barnard Castle.*
Leaven,	*Stokesley.*
Skerne, *l*	Darlington.
Durham Co.,	Hartlepool.
Wear,	Sunderland, *Houghton-le-Spring*, n., DURHAM, Bishop-Auckland, *Wolsingham.*
Tyne,	Tynemouth, S. Shields, N. Shields, NEWCASTLE, Gateshead, *Hexham, Haltwhistle, Aldstone.*
North Tyne, *l*	*Bellingham.*
Allen,	*Allendale.*
Blyth,	*Blyth.*
Wansbeck,	Morpeth.
Coquet,	*Rothbury.*
Aln,	Alnwick.
Co. of Northumberland,	*Belford*, n.
Tweed,	Berwick.
Till,	*Wooler.*

Lakes.—The English lakes are few in number, very small in dimensions, and mostly confined to the Cumbrian group of mountains. Windermere, the largest of them, is 10½ miles long, and is drained by the Leven. Ulleswater, in the same county, is the second largest; whilst Bala, the largest in Wales, is 4 miles long, and is drained by the Dee. They are, however, celebrated for their beauty, for being the resort of tourists, and for containing a species of freshwater fish called the char, peculiar to the north-west corner of England, and considered a high luxury of diet. The other principal lakes are *Bassenthwaite*, *Derwentwater*, *Thirlemere*, *Crummockwater*, *Loweswater*, *Ennerdale Water*, and *Wastwater*, in Cumberland; *Haweswater*, *Grassmere*, and *Rydal*, in Westmoreland; and *Coniston Water*, in Lancashire.

Internal Communication.—England stands unrivalled among the nations for the number and extent of its railways, canals, navigable rivers, and turnpike roads. In January 1869 there were 58 main lines of railway in operation, with a vast number of branches, affording 8890 miles open for traffic, and the total cost of construction amounts to about £353,000,000. The whole kingdom, indeed, with the exception of central Wales and a small portion of the S.W. of England, is one huge network of railways. The Surrey iron railway, between Wandsworth on the Thames and Croydon in Surrey, was the first railway in England intended for public use, and was opened in 1805; but the Stockton and Darlington railway, opened in 1825, was the first to employ locomotive engines, and to excite the general

interest of the public. England is further intersected in every direction by canals, navigable rivers, and rivers rendered navigable by artificial means. The last mentioned are called *navigations*. The oldest canal is the *Sankey Brook Canal* in Lancashire, finished in 1768; and the total length of all the canals is estimated at about 2100 miles, besides 2000 miles of rivers rendered navigable by artificial means. England is also traversed by 25,000 miles of *Turnpike Roads*, and by about 100,000 miles of cross-roads, by means of which, and by the numerous canals and railways, commodities of all kinds are so easily and expeditiously conveyed to all parts of the kingdom, that they everywhere fetch about the same prices.

National Character.—The most striking characteristics of an Englishman are his love of liberty, justice, and independence, his high sense of honour and fair-dealing. To think, speak, and write as he pleases on all subjects—so long as he keeps within the bounds of truth and charity—he claims as his inalienable right; and to maintain this liberty he evinces indomitable courage, perseverance, and self-denial. To a stranger he appears cold, reserved, blunt, and haughty; but his candour, probity, and veracity secure him the respect of all. His humanity and philanthropy are of a highly practical character, as is evinced by the extraordinary number of charitable, benevolent, and religious institutions with which his country abounds. He is unrivalled for good taste in domestic architecture, and his home is always a model of cleanliness, neatness, and comfort; while his frugality, economy, and providence are evinced by his vigorous support of savings-banks, friendly societies, and insurance offices.

Literature.—There is perhaps no nation, ancient or modern, that excels England in the number of distinguished literary names. The following is a list of some of her most eminent and gifted sons in the various departments of science and literature: POETRY—Chaucer, Spenser, Shakespeare, Milton, Herbert, S. Butler, Waller, Prior, Dryden, Pope, Young, Cowper, Crabbe, Byron, Rogers, Coleridge, Southey, Wordsworth, Tennyson. HISTORY—Clarendon, Gibbon, Coxe, Roscoe, Napier, Lingard, Thirlwall, Hallam, Grote, Macaulay, Dr W. Smith, Philip Smith. SCIENCE AND PHILOSOPHY—Bacon, Boyle, Newton, Ray, Locke, Hobbes, Cudworth, Tucker, Malthus, Bentham, Davy, C. Hatton, Faraday, George and Robert Stevenson, Whewell, Sedgwick, Professor Owen. THEOLOGY—Bede, Wycliffe, Hooker, Jeremy Taylor, Chillingworth, Bishop Hall, Barrow, Walton, Patrick, Bishop Lowth, Owen, Howe, Baxter, Bunyan, Poole, Doddridge, Henry, Lardner, Butler, Samuel Clarke, Paley, Scott, R. Hall, Foster, Whately, I. Taylor, Dean Alford. MEDICINE—Harvey, Jenner, Heberden, Gooch, Hall, Willan, Bateman, Cooper. TRAVELS—Drake, Frobisher, Dampier, Anson, Byron, Cook, Denham, R. and J. Lander, Parry, Franklin, Speke, and Burton. FINE ARTS—Wren, Hogarth, Reynolds, Chantrey, Hayman, Gainsborough, Wilson, Opie, Romney, Wright, Northcote, Morland, Lawrence, Haydon, Turner, Landseer, Purcell. MISCELLANEOUS—Addison, Johnson, Bentley, Sydney Smith, De Foe, Fielding, Warren, Thackeray, Dickens.

SCOTLAND.

Position and Boundaries.—Scotland forms the north part of Great Britain; the mainland extends from lat. 54° 38′ to 58° 40′ north, and from lon. 1° 46′ to 6° 14′ west; thus occupying 4° 1′ of lat. and 4° 28′ of lon. It is bounded on the N. by the Pentland Firth, on the E. by the North Sea, on the S. by England, and on the W. by the Atlantic.

Form, Coast-Line, and Extreme Points.—Of an oblong but extremely irregular form, with numerous deep indentations, especially on the west. The extreme points are, the Mull of Galloway in the S., Dunnet Head in the N., Buchanness in the E., and the Point of Ardnamurchan in the W. Including the islands, the most northerly point is Unst, in lat. 60° 49′; and the most westerly, St Kilda, in lon. 8° 34′ west. The coast-line is so extremely irregular as to suggest the idea that the country is about to separate into fragments: length, including the main inlets of the ocean, 2500 miles, or 1 mile of seabord for every 11 square miles of surface. This ratio is unparalleled in any other European country except Greece.

Area and Population.—Including the islands, the area is 30,685 sq. m., or 19,639,377 acres, being considerably more than one-third of the area of Great Britain with the circumjacent 186 isles. Extreme length of mainland 276 miles, with a breadth varying from 30 to 175 miles; but from the Mull of Galloway to the extreme north of Shetland about 450 miles, and from Peterhead to St Kilda about 250 miles. In 1861 the population was 3,062,294, being nearly 100 persons for every sq. m.; but in 1869 it was estimated at 3,205,481, or 104 to the sq. m. In 1801 the population was only 1,608,420: it has therefore nearly doubled itself in the last seventy years. The population is about equally divided between town and country, there being 225 cities and towns with an average population of 6654. The counties containing the largest population are, Lanark, with 631,000; Mid-Lothian, 274,000; Aberdeen 222,000; while Kinross has only 7977, and Nairn 10,065. The most densely peopled counties are, Edinburgh, which has 746 persons to every sq. m., Renfrew 719, and Lanark 710; whereas Sutherland has only 13 persons to the square mile, Inverness 21, and Ross 26.

Political Divisions.—Scotland is politically divided into 33 counties, 13 of which are southern, 10 central, and 10 northern. The central counties are separated from the southern by the Firths of Forth and Clyde and the Grand Canal connecting them; and from the northern by the Grampian chain.

Thirteen Southern Counties.

Edinburgh or **Mid-Lothian.**—Edinburgh 168 n., Leith 34, Portobello 4, Musselburgh 7 (F. of Forth), Dalkeith 5 (Esk).

Between 1000 *and* 2500 *inhabitants.*—Penicuik, Newhaven, Loanhead.

Haddington or E. Lothian.—HADDINGTON 4 (Tyne), Dunbar 4 (F. of Forth).

North Berwick, Tranent, Prestonpans.

Berwick.—GREENLAW 1 (Blackadder), Dunse 3 (Whiteadder).

Coldstream, Eyemouth, Earlston.

Roxburgh.—JEDBURGH 3 (Jed), Hawick 8 (Teviot), Kelso 4 (Tweed).

Melrose, New Castleton, Wilton.

Dumfries.—DUMFRIES 12 (Nith), Annan 5 (Annan).

Thornhill, Lockerby, Lochmaben, Langholm, Moffat.

Kirkcudbright.—KIRKCUDBRIGHT 3 (Dee), Maxwelltown 4 (Nith).

Castle Douglas, Creetown, Gatehouse, Dalbeattie.

Wigtown.—WIGTOWN 2 (Wigtown Bay), Newton Stewart 3 (Cree), Stranraer 4 (L. Ryan).

Whithorn, Glenluce, Port Patrick.

Ayr.—AYR 19 (Ayr), Saltcoats 5, Ardrossan 3, Largs 3 (F. of Clyde), Irvine 4, Kilmarnock 23, Galston 3, New Mills 3 (Irvine), Kilwinning 4, Dalry 4, Kilbirnie 3 (Garnock), Stewarton 3 (Annock), Girvan 6, Maybole 4 (Girvan), Beith 3 (Black Cart).

Muirkirk, West Kilbride, Waterside, Mauchline, Troon, Dalmellington, Catrine, Cumnock, Auchinleck, Crosshill, Darvel, Eglinton, Hurlford, Kilmaurs, Peesweep, Tarbolton.

Renfrew.—RENFREW 3, Port Glasgow 7, Greenock 42 (F. of Clyde), Paisley 47, Pollockshaws 7 (White Cart), Johnston 6, Kilbarchan 3 (Black Cart), Barrhead 6 (Levern).

Gourock, Busby, Linwood, Lochwinnoch, Neilston, Eaglesham, Thornliebank, Bridge of Weir, Nitshill.

Lanark.—LANARK 5, Glasgow 447, Rutherglen 8, Hamilton 10, Carluke 3 n., Motherwell 3 n. (Clyde), Airdrie 13, Coatbridge 10 (N. Calder), Wishaw 6 (S. Calder), Strathaven 4 (Avon).

Calder, Calderbank, Bellshill, Baillieston, Shettleston, Tollcross, Springburn, Kirkfield Bank, Chapelhall, New Lanark, Rosehall, Uddingston, Blantyre, Shotts, Lesmahago, Douglas, E. Kilbride, Biggar, Bothwell, Carfin, Holytown, Newarthill, Cambusnethan, Coltness.

Linlithgow or W. Lothian.—LINLITHGOW 4, Bathgate 5 (Avon), Bo'ness 3 (F. of Forth).

South Queensferry, Whitburn, Crofthead, Armadale.

Peebles.—PEEBLES 2 (Tweed), Innerleithen 1 (Leithen).

Selkirk.—SELKIRK 4 (Ettrick), Galashiels 6 (Gala Water).

TEN CENTRAL COUNTIES.

Fife.—CUPAR 5, St Andrews 5 (Eden), Kirkcaldy 6, Burntisland 3 (F. of Forth), Dunfermline 8 (Lyne), Leven 3 (Leven).

Falkland, Auchtermuchty, Lochgelly, Markinch, Oakley Prinlaws, St Monance, Anstruther, Pittenweem, Buckhaven, Wemyss, Kinghorn, Inverkeithing, Dysart, Ferry-Port-on-Craig, Newburgh, Cowdenbeath, Crossgates, Leslie.

Kinross.—KINROSS 2, Milnathort 2 (Leven).

Clackmannan.—CLACKMANNAN 1 (Black Devon), Alloa 6, Tillicoultry 4, Dollar 2 (Devon).

Stirling.—STIRLING 10 (Forth), Falkirk 9 n. (Carron), Kilsyth 5, Alva 3 (Devon).

Bannockburn, Stenhousemuir, Grangemouth, Carron, Dunipace, Lauriston, Milngavie, Camelon, Denny, Balfron.

Dumbarton.—DUMBARTON 8, Helensburgh 3 (Clyde), Renton 3, Alexandria 4, Bonhill 3 (Leven), Kirkintilloch 6 (Kelvin).

Cumbernauld, Duntocher.

Bute.—ROTHESAY 7 (E. coast of Bute).

Brodick (in Arran), Millport (in Cumbrae).

Argyll.—INVERARY 1 (L. Fyne), Campbelton 6 (Kilbrannan Sd.), Dunoon 3 (Clyde).

Tarbert, Lochgilphead, Tobermory, Oban, Bowmore, Port Ellen.

Perth.—PERTH 26 (Tay), Crieff 4 (Earn), Auchterarder 3 (Ruthven), Blairgowrie 3 (Ericht), Kincardine 2 (F. of Forth).

New Scone, Dunkeld, Stanley, Coupar-Angus, Aberfeldy, Errol, Abernethy, Muthill, Comrie, Dunning, Methven, Alyth, Blair Atholl, Bridge of Allan, Dunblane, Doune, Callander, Blackford, Rattray.

Forfar.—FORFAR 9 (Dean), Kirriemuir 3 (Gairie), Broughty Ferry 4, Dundee 90 (F. of Tay), Arbroath 18 (coast), Montrose 15, Brechin 7 (S. Esk).

Carnoustie, Ferryden, Letham, Friockheim, Southmuir.

Kincardine.—STONEHAVEN 3 (coast).

Luthermuir, Laurencekirk, Bervie, Johnshaven, Banchory.

TEN NORTHERN COUNTIES.

Aberdeen.—ABERDEEN 74 (Dee), Woodside 4, Inverury 3 (Don), Huntly 3 (Deveron), Peterhead 8, Fraserburgh 3 (coast).

Kintore, Old Meldrum, Ellon, Strichen, Turriff, Pitsligo, Rosehearty, *Balmoral.*

Banff.—BANFF 4, Macduff 3 (Deveron), Cullen 4, Buckie 3 (coast), Keith 3 (Isla).

Portsoy, Aberchirder, Dufftown.

Moray or **Elgin.**—ELGIN 6 (Lossie), Forres 3 (Findhorn).

Lossiemouth, Fochabers, Rothes, Burghead, Hopeman.

Nairn.—NAIRN 3 (Nairn).

Inverness.—INVERNESS 9 (Ness).

Fort George, Fort William, Beauly, Grantown, Kingussie, Portree (I. of Skye).

Ross.—DINGWALL 2 (Cromarty F.), Tain 2 (Dornoch F.)

Fortrose, Invergordon, Alness, Evanton, Plockton, Maryburgh, Avoch, Stornoway (in Lewis).

Cromarty.—CROMARTY 2 (Cromarty F.), Ullapool 1 (Lochbroom).

Sutherland.—DORNOCH 1 (Dornoch Firth).

Golspie. Helmsdale.

Caithness.—WICK 6 (E. coast), Thurso 3 (Pentland F.)

Lybster, Castletown.

Orkney and Shetland.—KIRKWALL 4, Stromness 2 (Orkney), Lerwick 3 (Shetland),

Descriptive Notes.—At the last census there were only two towns in Scotland with more than 100,000 inhabitants (Glasgow and Edinburgh); two between 100,000 and 50,000 (Dundee and Aberdeen), five between 50,000 and 20,000 (Paisley, Greenock, Leith, Perth, and Kilmarnock), seven between 20,000 and 10,000 (Ayr, Arbroath, Montrose, Airdrie, Dumfries, Stirling, and Hamilton), and thirty-three between 10,000 and 5000—being in all forty-nine towns of upwards of 5000 inhabitants, or 300 towns above 1000 inhabitants.

THE THIRTEEN SOUTHERN COUNTIES.

EDINBURGH lies in the basin of the Forth, and on the south side of the firth or estuary of that name.—Nearly all Coal-measures, but trap in the Pentland Hills, and Lower Silurian in the S.E.; Surface hilly, having the Moorfoot Hills in the S.E., the Pentland Hills in the centre, and the Corstorphine Hills, including Arthur's Seat, near Edinburgh, in the N.; soil very fertile, and highly cultivated in the level parts; extensive nurseries and vegetable gardens near the capital. Minerals highly valuable, especially coal and ironstone, which are extensively wrought, and sandstone (at Craigleith) of a very superior quality; one vast bed of coal, between Carlops and Musselburgh, is 15 miles long by 8 broad, and contains 33 seams. Manufactures less important, but extensive paper-mills on the Esk and Water of Leith, as also several breweries, distilleries, and potteries. **Edinburgh**, near the Firth of Forth, the capital of Scotland since the reign of James II., is one of the most chastely built cities in Europe. It is often called the Modern Athens, from the taste and elegance of its architecture. In literary fame it greatly surpasses every city in the United Kingdom, with the exception of London. Printing and publishing is carried on extensively, and there are several quarterly reviews of the first class, 10 newspapers, and many other periodical works. But Edinburgh is chiefly celebrated for its University (founded in 1582, erected in 1789), with 34 professors, from 1800 to 2000 students, and a library containing 122,000 printed books and 500 MSS. This University holds a high rank as a medical school, while in mental and moral science it stands unrivalled in Britain. Among its most illustrious professors may be named Dugald Stewart, Thomas Brown, and Sir William Hamilton. Besides the University of Edinburgh there is another distinguished theological seminary called the New College, where the ministers of the Free Church of Scotland receive their theological training. Among the most remarkable public buildings may be mentioned the Castle, situated on a precipitous rock, and once a place of great strength,—it contains the regalia of Scotland, a garrison, and barracks for 2000 men; the Palace of Holyrood, founded by David I. in 1128, which forms the residence of the sovereign when visiting the Scottish capital, and which, along with Beverley in

Yorkshire, has the privilege of sanctuary; St Giles's Cathedral, where the Solemn League and Covenant was subscribed in 1643; Victoria Hall, where the General Assembly of the Established Church of Scotland holds its annual meetings; Parliament House, where the Scottish Parliament met before the Union; the Advocates' Library, the largest and most valuable collection of books in Scotland, containing 150,000 printed volumes and 1700 MSS., and entitled to a copy of every book issued in the United Kingdom; the Signet Library, containing 50,000 volumes; the Royal Institution; the National Gallery; Museum of Science and Art; the High School; and Sir Walter Scott's Monument. **Leith**, two miles N.E. of Edinburgh, of which it is the seaport, has a commodious harbour, and considerable colonial and foreign trade. In 1869, 4134 vessels, of 980,410 tons burden, entered and cleared the port; the exports amounted to £1,500,000, and the customs-dues to £500,000.

HADDINGTON lies E. of Mid-Lothian, and in the basins of the Forth and Tyne. — Carboniferous in the W., Devonian in centre and E., Silurian in the S., and trap in the N. Surface hilly in the S., where are the Lammermoor Hills, level in the centre and N.; soil mostly a clayey loam, and highly fertile. Coal is worked in the carboniferous district, and limestone abounds in many places. The chief manufactures are salt and pottery wares at Prestonpans and Tranent; several extensive distilleries; and fisheries at Dunbar. **Haddington**, a small town on the Tyne, has the largest market in Scotland for agricultural produce; the b.-p. of John Knox and Alexander II. **North Berwick**: near it is Tantallan Castle, an ancient stronghold of the Douglases; and the Bass Rock, at one time the State prison for the kingdom, where many of the Scottish reformers were incarcerated. **Prestonpans**: here Charles Stewart, the Pretender, defeated the royal forces under Cope, in 1745.

BERWICK lies S.E. of Haddington, in the basin of the Tweed.—Silurian in the N., Devonian in W., and carboniferous limestone in S.E. Surface hilly and barren in the N., where are the Lammermoors; but the districts of Lauderdale in the W., and Merse in the S., are highly fertile and well cultivated; agriculture in a highly advanced state; wheat and turnips are the principal crops. Minerals and manufactures unimportant; but many interesting remains of antiquity, such as castles, towers, abbeys, and priories. **Greenlaw** is the smallest county town in Scotland, with the exception of Dornoch. **Dunse**, the birthplace of Duns Scotus. Thomas Boston, and M'Crie the historian.

ROXBURGH, S. of Berwick, is nearly all in the basin of the Tweed.—Carboniferous in S., Devonian in centre and N., Silurian in W., with an extensive tract of trap-rock in the E. Surface hilly in the vicinity of the Cheviots, but elsewhere a level and fertile plain; agriculture improving, but the county is chiefly pastoral; minerals—coal, lime, marl, and freestone; the manufactures are chiefly Scotch tweeds and other woollens. **Jedburgh**, near the Cheviot Hills, is famous in Border warfare, in which it repeatedly suffered by fire. **Hawick**, on the Teviot, is a thriving manufacturing town. **Kelso**, on the Tweed, at its junction with the Teviot, a beautiful little town, with the remains of an abbey built by David I. *Melrose Abbey*, on the Tweed, is the most magnificent ruin of the kind in Scotland. Other famous abbeys in this county and on the same river are—*Dryburgh Abbey* and *Jedburgh Abbey*, also *Abbotsford*, the beautiful residence of the late Sir Walter Scott.

DUMFRIES, S.W. of Roxburgh, in the basins of the Nith, Annan, and Esk.—Chiefly Lower Silurian, but New Red in the S., and carboniferous limestone in the S.E. The county is divided into three districts—Niths-

dale, Annandale, and Eskdale. Surface generally hilly, especially in the N. and N.E., where is the Lowther range; soil fertile in the lowlands, and affording good pasturage on the high grounds; minerals—limestone, coal, and lead. **Dumfries**, with its suburb **Maxwelltown**, is a thriving town, and the provincial capital of the south of Scotland. Here are interred the remains of Robert Burns, the Scottish poet, and of John Comyn, who was stabbed by Robert Bruce in 1306. **Annan**, on a river of same name, with a good natural harbour: shipbuilding, cotton factories, and rope-works; considerable export trade. **Moffat**, a neat village much frequented by invalids, who resort here to the chalybeate and sulphurous springs.

KIRKCUDBRIGHT, or East Galloway, W. of Dumfries, chiefly in the basins of the Dee and Nith. Nearly all Lower Silurian; surface hilly; climate mild and moist; soil productive in the south, but the main part only affording pasture for sheep, which are reared in great numbers. **Kirkcudbright**, on the Dee, near its mouth in the Solway, has the best harbour in the south of Scotland, but little trade.

WIGTOWN, or West Galloway, W. of Kirkcudbright, a peninsular county in the extreme S.W. of Scotland. Is all Lower Silurian; surface undulating, with many small lakes; soil fertile, well tilled, or in excellent pasture; climate moist and mild; breeds of cattle very superior; abounds in Druidical antiquities. **Wigtown**, a small town, with steam communication to Liverpool. **Newton-Stewart**; hand-loom weaving, and trade in wool with Lancashire. **Stranraer**; hand-loom weaving, tanneries, nail-factories, steam communication with Glasgow, Belfast, and Whitehaven, and submarine telegraph to Carrickfergus. **Port-Patrick**, 21½ m. from Ireland, a small town, with a line of submarine telegraph to Donaghadee.

AYR, N. of Wigtown, lies in the lower basin of the Clyde. Carboniferous in the N. and W., Devonian in the centre, and Lower Silurian with trap in the S. Surface mountainous, but fertile tracts of land along the coast; agriculture in an improved state, and the soil extensively drained; iron and coal mines numerous; manufactures of woollen and cotton stuffs, and embroidered work. Ayrshire consists of three districts—*Carrick* in the S., *Kyle* in the centre, and *Cunningham* in the N. **Ayr**, a fine seaport town, with large exports of coal, an extensive general trade, and several factories, is the scene of the early achievements of Sir William Wallace. **Saltcoats** (so called from its manufactures of salt); shipbuilding docks, weaving and embroidery. **Largs**, memorable for the victory obtained by Alexander III. over Haco, king of Norway, in 1263. **Irvine**, with large export trade in coal; weaving of book-muslin and jaconets. **Kilmarnock**, by far the largest town in the county, has numerous manufactures. **Girvan** is chiefly engaged in the cotton manufacture.

RENFREW, N. of Ayr, in the basin of Clyde, consists of coal-measures in the E., and all the rest trap; surface level, except in the W.; coal, limestone, and freestone abound; the manufactures are shawls, and silk and cotton stuffs; two-fifths arable. **Renfrew** is the nominal capital of the county. **Port-Glasgow**, a thriving town, with a good harbour and docks, was long the port of Glasgow, and continues to be the chief port in the Clyde for importing American timber. **Greenock**, a large thriving town on the Clyde, and the greatest seaport in the west of Scotland; famous for ship and steamboat building; and the birthplace of James Watt, who invented the steam-engine. **Paisley**, an important manufacturing town; has been long famous for shawls, muslins, and cotton thread; coal and iron mines in the vicinity, which afford material for its numer-

ous iron-works. It was the birthplace of Professor Wilson, of Alexander Wilson the ornithologist, and of Robert Tannahill the poet.

LANARK, E. of Renfrew, in the basin of the Clyde.—Carboniferous in the N., Devonian in the centre, and Lower Silurian in the S. Surface very variable, and only one-third arable; coal, iron, and lead mines very extensive and valuable. This is the greatest manufacturing county in Scotland. **Lanark**, the nominal capital, has a large statue of Sir William Wallace. **Glasgow**, the largest city in Scotland, and the third largest in Britain (being exceeded only by London and Liverpool), is the great seat of Scottish commerce and manufactures. Cotton is the principal staple, but there are numerous iron-furnaces and large coal and iron works. It is especially famous for shipbuilding and the construction of machinery. The University, founded in 1450, has 26 professors, about 1200 students, about 80 scholarships, a library of 59,000 volumes, and a museum founded by Dr W. Hunter, containing a valuable collection of natural curiosities. There are many other magnificent public edifices, amongst which are St Mungo's Cathedral, the only perfect specimen of the ancient Gothic in Scotland, and the new Royal Exchange: pop. (in 1869) 516,000; in same year, 8830 vessels of 2,161,050 tons burden, entered and cleared the port. **Rutherglen** and **Hamilton**, considerable manufacturing towns on the Clyde. **Airdrie** and **Wishaw** have extensive coal and iron mines in their vicinity.

LINLITHGOW, or West Lothian, N.E. of Lanark, in the basin of the Forth.—Almost wholly carboniferous; surface beautifully varied and undulating; soil generally fertile, but swampy in the south, and three-fourths arable; coal extensively wrought; manufactures unimportant. **Linlithgow** contains the remains of a royal palace, where Mary Queen of Scots was born in 1542. **Bathgate**, with a well-endowed academy; here is wrought the celebrated Torbanehill mineral. **Bo'ness**, with a coal and iron mine extending under the bed of the Forth.

PEEBLES, E. of Lanark, in the basin of the Tweed.—Almost entirely Lower Silurian, but a little coal and Devonian in the N.W.; surface well wooded, but full of hills and bogs; one-third arable, and two-fifths in pasture; large numbers of sheep and cattle reared. Coal is raised in the N.W.; a few woollen manufactures. **Peebles**, a small town at the confluence of the Tweed and the Eddleston, with various woollen manufactures. **Innerleithen**, with a mineral spring, the "St Ronan's Well" of Sir Walter Scott.

SELKIRK, between Peebles and Roxburgh, in the basin of the Tweed, was formerly called Ettrick Forest.—Wholly Lower Silurian; surface mostly mountainous, but one-half arable; chiefly a pastoral county, producing excellent breeds of sheep and cattle. **Selkirk**, on the Ettrick, near which is the birthplace of Mungo Park, the African traveller; long famous for the manufacture of shoes, and hence the corporation was called "the Sutors of Selkirk." **Galashiels**, with highly-flourishing manufactures of tweeds, is rapidly increasing in population.

THE TEN CENTRAL COUNTIES.

FIFE, a peninsular county between the Firths of Forth and Tay.—Chiefly carboniferous, largely interspersed with trap; surface diversified; two-thirds under cultivation. The "How of Fife," traversed by the Eden, is very productive. Minerals, coal and lime; manufactures, linen; exports—coal, lime, and fish. **Cupar**, on the Eden, and in the centre of the "How of Fife," with spinning-mills and linen manufactures. **St Andrews**, a town of great antiquity, with a celebrated University, the

oldest in Scotland, founded in 1411; consists of two colleges, named St Mary's, which is a divinity hall, and St Salvator, now united with St Leonard's, with 14 professors, and 74 bursaries of £1000 annual value. St Andrews was long the ecclesiastical capital of Scotland, and was the scene of many of the most remarkable political and religious events in Scottish history. **Kirkcaldy** has considerable trade; and is the b.-p. of Adam Smith, author of 'The Wealth of Nations.' **Dunfermline**, a place of great historical interest, and noted in modern times for its linen manufactures; here was born Charles I., and here Charles II. subscribed the Solemn League and Covenant in 1650.

KINROSS, W. of Fife, in the basin of the Forth, is the second smallest county in Scotland.—Coal-measures in the S. and E., and trap in the N. and W.; surface varied and well cultivated; minerals and manufactures unimportant. **Kinross**, on Loch Leven, a small town with manufactures of cotton, tartan shawls, and damasks.

CLACKMANNAN, W. of Kinross, in the basin of the Forth, is the smallest county in Scotland.—Principally carboniferous, but trap-rocks in the N. The river Devon, whose banks are highly fertile, traverses the county on its way to the Forth. Principal minerals—coal, ironstone, and sandstone. **Alloa**, the principal town, near the head of the Firth of Forth, has considerable export trade and shipbuilding, and is noted for its excellent ale.

STIRLING, W. of Clackmannan, in the basins of the Forth and Clyde.—Carboniferous and trap in E. and S., Devonian in the centre, and crystalline rocks in the W. Surface mountainous, especially in the W., where Ben Lomond attains a height of 3192 feet. The Carse lands, along the Forth, are level and fertile, and two-thirds of the whole county arable. Minerals—coal, ironstone, and freestone. Here are the celebrated Carron Iron-works. Manufactures—carpets, tartans, tweeds, winceys, blankets, paper, and chemical products; many cotton-mills, foundries, dye-works, and distilleries. **Stirling**, on the right bank of the Forth, is a place of great historical importance in the early annals of Scotland, contains a castle of great antiquity, which is one of the four military depots still upheld in Scotland by virtue of the Articles of Union. **Falkirk** is the seat of three great annual cattle-fairs, called "Trysts," at which usually 300,000 cattle and sheep exchange hands. Two memorable battles were fought here; one between Wallace and Edward I. in 1298, and the other between Prince Charles Edward and the royal army in 1746. **Bannockburn**, famous for a victory gained by the Scots, under Bruce, over the English in 1314. **Kilsyth**—cotton-weaving, coal and iron mines; here Montrose gained a victory over the Covenanters.

DUMBARTON, W. of Stirling, in the basin of Clyde.—Geological structure same as last; surface mostly mountainous; soil poor, but fertile and well cultivated in the lowlands; iron and coal mines, with quarries of limestone and freestone; cotton-mills, glass-works, paper-mills, and print-fields. **Dumbarton**, on the Leven, near its confluence with the Clyde, with an ancient castle, one of the four upheld by Government. **Helensburgh**, a watering-place on the Clyde. **Kirkintilloch**, with manufactures of hats, cotton-weaving, and iron-foundries.

BUTE AND ARRAN, two large islands, with several smaller, in the Firth of Clyde.—Bute is Devonian in S., Silurian in the middle, and mica slate in N.; while Arran is extremely varied, being almost an epitome of the geology of Great Britain. Both islands are mountainous in the N. and undulating in the S. Goatfell, in Arran, attains a height of 2874 feet, and the entire island is celebrated for its romantic scenery and interesting geological features. The climate of Bute is very mild and moist, which

renders it the resort of many invalids. **Rothesay**, at the head of a bay on the E. side of Bute, is a famous resort of invalids and sea-bathers. **Lamlash**, in Arran, with a well-protected harbour.

ARGYLL, N. of Bute, and in the extreme west of Scotland, chiefly consists of peninsulas and islands.—Metamorphic rocks, with large patches of granite and trap. It is the second largest county in Scotland, and one of the most thinly peopled, having only 27 persons to each square mile. Surface mountainous, and only a small part cultivated; cattle largely reared for exportation. **Inverary**, on Loch Fyne, principally supported by its herring-fishery. **Campbelton**, on the E. coast of Cantyre, with distilleries and malt-houses. **Duncon**, a fashionable watering-place on the Clyde.

PERTH, N.E. of Argyll, in the basins of the Tay and Forth.—Chiefly metamorphic, but Devonian and coal in the S. and E. It is the third largest county in Scotland; surface extremely diversified, and comprising both a highland and lowland region; the Grampian range traverses it in a north-easterly direction. The Carse of Gowrie is very fertile, but only two-thirds of the county is under culture; agriculture greatly improved; beautiful scenery and large plantations. Minerals—coal, limestone, sandstone, marble, and slate; and lead found in some places; manufactures unimportant, except at Perth. **Perth**, a beautiful city on the Tay, was the capital of Scotland till 1440; had the royal palace of *Scone* in the vicinity: it is very ancient, and figures prominently in Scottish history. **Crieff**, a beautiful little town near the foot of the Grampians. **Auchterarder**: here originated the famous controversy between the civil and ecclesiastical courts, which led to the dismembermeut of the Church of Scotland in 1843.

FORFAR, or Angus, E. of Perth, in the basins of the Tay, South Esk, and North Esk.—Nearly all Devonian, but metamorphic in the N.W.; surface varied, and divided into four parallel belts—viz., Braes of Angus, Vale of Strathmore, Sidlaw Hills, and the plain along the Firth of Tay. Soil various, but agriculture in a highly advanced state. Forfarshire is the chief seat of the coarse-linen manufacture of Scotland. **Forfar**, in the fertile valley of Strathmore, is the nominal capital. **Dundee**, at the mouth of the Firth of Tay, is the third largest town in Scotland, and the principal seat of the linen, jute, and glove manufacture; is a highly-flourishing town, with a large export trade; in 1869, 2543 vessels, of 472,015 tons burden, entered and cleared the port. **Arbroath**, also called **Aberbrothock**, from its position on the mouth of the little river Brothock—a large thriving town, with numerous manufactures. **Montrose** exports more corn than any other seaport in Scotland; numerous manufactures; the birthplace of the celebrated Marquess of Montrose and of Joseph Hume. **Brechin**, an ancient Episcopal city, with an old cathedral; in its vicinity is the residence of the Earl of Dalhousie.

KINCARDINE, or the Mearns, N.E. of Forfar, between the N. Esk and the Dee.—Devonian in the S. and gneiss in the N.; surface highly mountainous, being chiefly occupied by the Grampians; but the "How of the Mearns," in the S. and E., is a low, rich, arable tract. The mountains yield extensive pasture for sheep, and about half of the county is under cultivation. Granite and sandstone are the principal minerals; and the chief manufactures are coarse linen and wooden snuff-boxes. **Stonehaven**, a small town between the rivers Cowie and Carron, has a herring-fishery, and some manufactures of cotton and linen. Near it is Dunottar Castle, formerly the residence of the Earls Marischal, and celebrated in Scottish history.

The Ten Northern Counties.

Aberdeen, N. of Kincardine, and between the Dee and Deveron.—Granite and metamorphic rocks, with two patches of Devonian in the W. and N.; surface very mountainous in the S.W., along the Grampians; the rest level or undulating; only one-third arable, which is under the most skilful cultivation; more fat cattle reared than in any other county in Scotland. The county is especially celebrated for its beautiful granite, large quantities of which are shipped to London; there are also important slate and sandstone quarries, and extensive salmon-fisheries. Manufactures recently very flourishing, especially woollen, cotton, and linen, but now greatly declined. Balmoral Castle, the Highland residence of Queen Victoria, on the river Dee, is in this county. **Aberdeen**, between the mouths of the Dee and Don, is the fourth most populous town in Scotland; it is a handsome city, built of beautiful grey-coloured granite; is a place of great trade, and the seat of a flourishing university, with 23 professors and 270 scholarships: in 1869, 2929 vessels, of 573,650 tons burden, entered and cleared. **Peterhead**, a thriving town on the north-east coast, near Buchanness, the most easterly point in Scotland; has an important herring-fishery, and is the great emporium of the whale-fishery.

Banff, N.W. of Aberdeen, in the Moray basin, and between the Deveron and the Spey.—Mainly metamorphic rocks; but granite in the N., and Old Red in the W.; surface mountainous, except along the coast, where it is level and moderately fertile; only about a third is under cultivation; cattle-breeding is the principal branch of rural industry; but there are important fisheries carried on in the small towns and villages along the coast. The principal minerals are limestone for agricultural purposes, and granular quartz, exported from the Hill of Durn, near Portsoy, to the English potteries. **Banff** and **Macduff**, seaport towns, at the mouth of the Deveron, with considerable export trade. **Cullen**, **Buckie**, and **Portsoy**, neat little towns on the Moray Firth, with extensive herring-fisheries. **Keith**, the birthplace of James Ferguson.

Moray, or Elgin, W. of Banff, in the Moray basin, between the Spey and the Findhorn.—Old Red in the N., which is highly fossiliferous, and gneiss in the remainder; surface, level along the firth, elsewhere mountainous; only about one-fifth under cultivation; soil a deep loam, or light and sandy; very fertile in the N., and highly cultivated; fine crops of wheat. Sandstone is the principal mineral, and is extensively exported; other exports are grain, cattle, salmon, and timber from the ancient forests of Strathspey and Darnaway. The principal manufactures are woollens; tanneries, distilleries, and tileworks are numerous. **Elgin**, on the Lossie, about five miles from its seaport (Lossiemouth), has the remains of a beautiful cathedral, erected in 1224—one of the finest ruins in Scotland. **Forres**, a beautiful little town near the Findhorn, with enchanting scenery; celebrated in Shakespeare's 'Macbeth.' **Lossiemouth**, a thriving seaport town; here, in 1869, a very rich vein of lead was discovered, with traces of copper.

Nairn, W. of Moray, in the Moray basin, is drained by the Nairn and Findhorn.—Old Red in the N., gneiss in the S., and some granite in the W. Surface, mostly rugged and mountainous, but nearly one-half cultivated; agriculture in an advanced state, but no important minerals or manufactures. **Nairn**, an antiquated-looking little town, with exports of fish, stones, grain, and timber; near it Cawdor Castle, where, according to tradition, King Duncan was murdered.

INVERNESS, S.W. of Nairn, chiefly in the Ness or Moray basin, is the largest county in Scotland; area, 4256 square miles; population 88,888, being 21 persons to the sq. m.—Gneiss and mica slate, with a patch of Old Red in the N.E., but trap and Old Red in Skye; surface highly mountainous; Ben Nevis, the highest mountain in the British Isles (4406 feet), is in the S.W. It is well wooded, and a chain of lakes, connected by the Caledonian Canal, passes through the centre. Soil light and unproductive, with more than one-half wholly waste; but there are immense forests where the red and roe deer roam in safety. The county is chiefly pastoral, and the principal exports are black cattle, sheep, and wool. Here the Celtic language and character are still found in their purest forms. **Inverness**, at the mouth of the Ness, and near the entrance of the Caledonian Canal, a fine, old, romantic town, regarded as the capital of the Highlands, and the most populous town north of Aberdeen, with which it is connected by railway. It is the only important town in Britain in which the Gaelic language is usually spoken by all classes of the inhabitants. Near it, **Culloden Moor**, where the pretensions of the Stewart dynasty were finally extinguished in 1746. **Fort George**, the most complete fortification in the kingdom, has accommodation for 2000 men.

ROSS, N. of Inverness, and between the Moray Firth and the Minch.—Almost wholly metamorphic, but Old Red along the two coasts; surface very mountainous, and only one-fifth arable; fertile on the Moray Firth, producing excellent wheat, but the main portion is pastoral; exports chiefly sheep and wool. **Dingwall**, an antique-looking little town at the head of the Cromarty Firth; near it, **Strathpeffer**, with highly medicinal chalybeate and sulphurous springs, resembling those of Harrogate, and frequented by a large number of invalids. **Tain**, a neat thriving town on the Dornoch Firth, and the most important between Inverness and Wick.

CROMARTY consists of fourteen detached portions, scattered over the northern half of Ross-shire. This singular arrangement into patches was formed at the request of a former Earl of Cromarty, who desired that one county might contain all his lands, wherever situated. Its geology, drainage, soil, &c., same as Ross. The Cromarty Firth is completely land-locked, and affords excellent shelter for shipping. **Cromarty**, at the entrance of Cromarty Firth, is irregularly built, and of antique appearance; the birthplace of Hugh Miller, who commenced here his illustrious geological career.

SUTHERLAND, N. of Ross, and between the Moray Firth and the Atlantic.—Nearly all transition and Silurian rocks, with a little Old Red in N.W. and S.E., and an oolitic patch at Brora; surface wild and mountainous; scenery in many places singularly grand, and containing many lakes, which discharge their waters in three directions. The interior wholly depopulated, this being the centre of the far-famed Highland clearances, which commenced in 1807, and were repeated at various intervals. A vast number of the inhabitants have been expatriated, and the remainder reside in villages and hamlets along the coast, where they support themselves mainly by fishing. The interior is now let out into immense sheep-farms, which are chiefly in the hands of English capitalists; about 220,000 sheep are exported annually. **Dornoch**, on the Dornoch Firth, opposite Tain, is a mere village, and the smallest county town in the British Isles—population, 647. **Golspie**, a beautiful village on the east coast, with Dunrobin Castle, the ancient residence of the Earls of Sutherland, in the vicinity.

CAITHNESS, E. of Sutherland, and in the extreme N.E. of the mainland of Scotland, is a peninsula, lying between the Moray and Pentland Firths. —Almost wholly Devonian, which is highly fossiliferous in many parts, but along the west border there are several patches of granite; surface flat, destitute of trees, and uninteresting; soil various, a large portion being heath-covered moors, and only one-fourth under cultivation. Many good roads and piers have been recently constructed for the accommodation of the numerous fishing villages and hamlets on the east coast. About 200,000 barrels of salted herrings are exported annually; other exports are salmon, oats, and flagstones for paving. This county was, in the middle ages, held by the kings of Norway; most of its inhabitants are of Scandinavian descent, and speak a peculiar dialect of the Lowland Scotch, considerably resembling that of Orkney. **Wick**, including **Pulteneytown** which is twice its size, is a flourishing town on the east coast, with an immense pier and breakwater now in course of erection. For the last half-century it has been the headquarters of the Scottish herring-fishery. Upwards of 1000 boats are here employed, chiefly manned by Western Highlanders, who in the month of July congregate here in vast numbers. Here are two spirited weekly newspapers, and a rapidly-increasing export trade, consisting chiefly of herrings to the Baltic. **Thurso**, a beautiful little town on the Pentland Firth, and the most northerly on the mainland of Scotland. Its position is unfavourable to its prosperity as a fishing-town, being exposed to the north, and the rapid dangerous current of the Pentland Firth, across which the Orkneys are seen in all their bold grandeur.

ORKNEY AND SHETLAND form an insular county N.E. of the mainland. The former consists of an archipelago of 67 islands and islets, the principal of which are Pomona, South and North Ronaldsha, Hoy, Sanda, Rowsa, and Westra; shores bold, the interior generally undulating; climate mild; little snow falls in winter, but the summers chill and moist. Geological structure: wholly Devonian; soil good, but agriculture very backward: many of the people employed in fishing, or in taking wild birds and eggs; great quantities of lobsters are shipped to the London market. The Orcadians are expert seamen, and many of them are engaged in the Greenland whale fishery. Shetland, 48 miles N.E. of Orkney, consists of an archipelago of about 90 islands and islets, of which only 25 are inhabited. Mainland, the largest island, contains one-half the whole area, and more than a half of the population. The next largest are Yell and Unst, the latter being the most northern island in the British archipelago (lat. 60° 50′ N.)—Devonian in the S.; all the rest gneiss, with large patches of trap and granite; climate mild, but very damp and variable; surface generally mountainous, covered with heath, and destitute of trees: a considerable quantity of tolerable land has been made by long culture. The Shetland ponies are remarkable for their small size and hardihood, and are largely exported; other exports are ling, tusk, and cod. The only native manufacture is knitted hosiery; and the only mineral of importance is chromate of iron, which is exported for a pigment. The people of both archipelagos are of Norse extraction. Their language is now English, but indubitable traces of their Scandinavian origin are found in their names, manners, customs, superstitions, language, and antiquities. They became subject to Norway in the ninth century, embraced Christianity in the thirteenth, and were annexed to the Scottish crown in 1468. **Kirkwall**, the capital of the Orkneys and of the county above named, on a bay on the N.E. side of Pomona, with an ancient cathedral named St Magnus, and some manu-

factures of linen and straw-plait. **Lerwick**, the principal town in Shetland, on the S.E. of Mainland, is the most northern town in the British Isles; has manufactures of straw-plait, and whale, cod, and herring fisheries.

Capes and Promontories.—St Abb's Head, in Berwickshire; Fifeness, E. of Fife; Buchanness (Aberdeenshire), the most E. point of the mainland of Scotland; Kinnaird Head, at the entrance of the Moray Firth; Tarbetness, the E. extremity of Ross; Noss Head, and Duncansby Head, E. of Caithness; Dunnet Head, the most N. point of the mainland; Oldhead and Dennis Head, the S. and N. extremities of Orkney; Sumburgh Head, S. of Shetland; Hermaness, N. of Shetland, the most northern point in the British archipelago; Cape Wrath, N. of Sutherland; Butt of Lewis, N. of the Hebrides; Aird Point, N. of Skye; Point of Ardnamurchan (Argyll), the most western point of Great Britain; Mull of Cantyre, S. of Argyll; Mull of Galloway and Burrow Head, S. of Wigtown.

Islands.—The islands are very numerous, especially on the north and west coasts, and are naturally divided into three groups:—

On the North Coast.—The Orkneys, N.E. of Caithness: principal, Pomona and Hoy. The Shetlands, N.E. of the Orkneys: principal, Mainland, Yell, Fetlar, and Unst. *On the West Coast.*—The Hebrides or Western Islands, 160 in number, of which 70 are inhabited, and divided into two clusters, the Outer and Inner Hebrides, which are separated by the Little Minch. The *Outer Hebrides*, called also *Long Island*, lie W. of Sutherland and Ross: the principal are, Lewis, the largest island in Scotland; N. Uist, Benbecula, S. Uist, and Barra. The *Inner Hebrides*: principal, Skye, Mull, Iona, Jura, and Islay. Arran, Bute, and the Cumbraes, in the Firth of Clyde. *On the East Coast.*—May, Inchkeith, Inchcolm, in the F. of Forth; Inchcape, or the Bell Rock, off the entrance of the F. of Tay; Stroma, bet. Caithness and Orkney; Fair Island, bet. Orkney and Shetland.

Bays and Estuaries.—These are also numerous, and generally penetrate far into the mainland, in a N.E. and S.W. direction. Those on the east side are called *firths* (from Scandinavian *fiord*, pronounced "fiurth"), those on the W., *lochs*, corresponding to the *loughs* of Ireland. The principal are:—

F. of Forth, bet. the Lothians and Fife; St Andrews Bay, N.E. of Fife; F. of Tay, bet. Fife and Forfar; Moray F. in the N.E. of Scotland, 75 m. wide, bet. Kinnaird Head and Duncansby Head (its main parts are, Beauly F., bet. Inverness and Ross; Cromarty F., bet. Ross and Cromarty; Dornoch F., bet. Ross and Sutherland); Pentland F., bet. Caithness and Orkney; Thurso Bay, N. of Caithness; Kyle of Tongue and Loch Eribol, N. of Sutherland; Loch Laxford and Loch Enard, W. of Sutherland; Lochs Broom, Greinord, Ewe, Gairloch, Torridon, Carron, and Alsh, W. of Ross; Sleat Sound, bet. Inverness and Skye; Loch Hourn, in W. of Inverness; Sound of Raasay, bet. Skye and Raasay; Lochs Snizort and Bracadale, in W. of Skye; Sound of Harris, bet. Harris and N. Uist; Loch Sunart and Sound of Mull, bet. Mull and the mainland; Lochs Linnhé and Eil, forming the W. entrance to the Caledonian Canal; Loch Etive and Sound of Jura, W. of Argyll; Kilbrannan Sound, bet. Cantyre and Arran; Loch Fyne, in S. of Argyll; Sound of Bute,

bet. Arran and Bute; Loch Long, bet. Argyll and Dumbarton; Firth of Clyde, separating Arran, Bute, and Dumbarton from Ayr and Renfrew; Loch Ryan, Luce Bay, and Wigtown Bay, in Wigtownshire; Solway F., bet. the S.W. of Scotland and the N.W. of England; the Minch, bet. the Mainland and Lewis; Little Minch, bet. Skye and Long Island; Sound of Islay, bet. Islay and Jura; North Channel, bet. Scotland and Ireland.

Mountain System.—Scotland is a highly-mountainous country, there being few or no localities where mountain-ranges do not limit the observer's view in one or more directions. Proceeding from N. to S., we find five principal ranges, all of which are nearly parallel to each other, and follow the general direction of N.E. and S.W., similar to the principal estuaries.

The Northern Highlands, consisting of detached groups that commence at the southern border of Caithness, and cover a large portion of Sutherland, Ross, and Inverness, separate the waters which flow into the Moray Firth from those that find their way to the Atlantic. The principal summits are: Ben Attow, between Ross and Inverness, 4000 feet; Ben Wyvis, near Dingwall, 3422 feet; Ben Dearg, near head of Loch Broom, 3551 feet; Ben More, in Assynt, 3281 feet; Ben Cliberich, S. of Loch Naver, Sutherland, 3157 feet; Morven, in S.E. of Caithness, 2331 feet.

The **Grampians,** the loftiest mountains in the British Isles, cross the country in its widest part. They separate, for the most part, the Highlands from the Lowlands, and the basins of the Spey and Dee from that of the Tay on the east side, and the great valley of Glenmore and the Clyde basin on the west. Length, from Stonehaven to Loch Linnhé, about 100 miles, the height ranging from 2000 feet to upwards of 4000 feet. Ben Nevis, at the western extremity, 4406 feet high, is the culminating-point of the British Isles. The main range sends off two great lateral branches, one to the N. from the middle of the range, which soon bifurcates and encloses a large portion of Banffshire; and the other to the S. from near Loch Rannoch, in Perthshire, to the isthmus of Cowal in Argyll. Principal summits: Ben Nevis,* in the S.W. of Inverness, 4406 feet; Loch-na-gar, in Aberdeenshire, 3777 feet; Ben Macdui, in the S.W. of Aberdeenshire, 4295 feet; Cairngorm, in Banffshire, 4095; Ben Avon, bet. Banff and Aberdeen, 3826 feet; Cairntoul, near Ben Avon, 4245 feet; Schihallion, in Perthshire, 3564 feet; Ben Lomond, in Stirling, 3192 feet; Ben Cruachan, in Argyll, 3670 feet.

Ochil and Sidlaw Range, parallel with the Grampians, and separated from them by the valley of Strathmore, consists of three small chains, which extend across the country from Forfarshire to Stirlingshire, and form the N. water-parting of the Tay, Forth, and Clyde basins. The *Sidlaw Hills* extend from the river Dean in Forfarshire, to Perth on the Tay, but are of small elevation, the highest summit, the Kingseat, being only 1255 feet high. The *Ochils*, between Stirling and the F. of Tay, attain, in Ben Cleugh, an elevation of 2300 feet, and the *Campsie Fells*, in Stirlingshire, of 1500 feet.

The **Lammermoor and Pentland Range,** separated from the former by the F. of Forth, and forming the S. boundary of the Forth basin, consists

* No mountain in Scotland attains to the limit of perpetual congelation, which, in the latitude of the Grampians, is 4500 feet. Ben Nevis only wants about 100 feet of altitude to be capped continually with snow. Some of the ravines in the Grampians and North Highlands retain the snow over summer.

of the following members: the *Lammermoor Hills*, between Haddington and Berwick—highest summit, 1753 feet; the *Moorfoot Hills*, a W. continuation of the Lammermoors, 2130 feet; the *Pentland Hills*, in Mid-Lothian, 1806 feet; and *Tinto Hill*, in Lanarkshire, 2308 feet.

The **Cheviot and Lowther Range** extends from Peel Fell in the Cheviots proper (for which see "England," p. 135), to Loch Ryan in Wigtownshire, and forms the great water-parting of the S. of Scotland, separating the basins of the Clyde and Tweed on the N. from those of the Solway and Tyne on the S. The highest summits of this range are: Cheviot Peak, 2668 feet, Carter Fell, 2020 feet, in Northumberland; Ettrick Pen, in Selkirk, 2200 feet; Hart Fell, in Dumfries, 2638 feet; Broad Law, in Peebles, 2741 feet; Lowther Hill, in Lanark, 2522 feet; Mt. Merrick, 2764, and Black Larg, 2890 feet, both in Kirkcudbright.

River-Basins.—As the mountain-ranges in Scotland stretch from N.E. to S.W., so the intervening river-basins, in their greatest length and inclination, follow the same direction. The eight most important basins are those of the Tay (2090 sq. m.), Tweed and Solway (1990), Forth (1400), Dee and Don (1230), Spey (1245), Clyde (1145), Linnhé basin (1200), Moray basin (about 5000).

Three of the eight basins lie N. of the Grampian chain—viz., the Moray basin, and the basin of the Dee and Don (the waters of which nearly unite), on the E. side, and the Linnhé basin on the W.; and their united areas comprise almost the whole of the district known as the Scottish Highlands. Immediately S. of them lie the basins of the Tay and Forth on the E. side, and that of the Clyde on the W.; these touch each other, and are separated from the former three by the Grampian chain, and from the Tweed and the Solway basins by the Lammermoor and Lowther ranges: they are fertile and highly cultivated; contain most of the large towns, and many rich mines of coal, ironstone, and other valuable minerals; and have been called respectively the garden, the granary, and the workshop of Scotland. The first is separated from the second by the Ochil Hills, and the second from the third by the Campsie Fells. The basins of the Tweed and Solway constitute the Southern Highlands, and form an excellent pastoral country. They are separated from England by the Cheviot range, and from each other by the Lowthers; while the Tweed basin is separated from the Forth by the Lammermoor Hills, and the Solway basin from that of the Clyde by the Lowther range.

Table of Rivers and Towns.—For the arrangement adopted in the following table, compare what is said under "England," the only difference being that here large towns, or those printed in Roman letters, denote those having 2500 inhabitants or upwards; county towns are in SMALL CAPITALS, and all others in *italics*. One hundred rivers are here enumerated, 33 of which enter the ocean directly, the remainder being their tributaries; and 300 towns, one-third of which have a population exceeding 2500.

Basins inclined to the North Sea.

Rivers.	*Towns.*	*Rivers.*	*Towns.*
Tweed, ...	Berwick (England), *Coldstream*, Kelso, *Earlston*, n., *Melrose*, *Innerleithen*, PEEBLES.	Blackadder,	GREENLAW.
Whiteadder, *l*	Dunse.	Teviot, ...	Kelso, Hawick, *Wilton*.
		Jed, ...	JEDBURGH.
		Leader, *l* ..	*Lauder*.

Basins inclined to the North Sea (continued).

Rivers.	*Towns.*
Gala, *l*.....	Galashiels.
Ettrick, ...	SELKIRK.
Eddleston, *l*	PEEBLES.
Biggar, *l*....	*Biggar.*
Eye, ...	*Eyemouth.*
Co. of Haddington,	Dunbar.
Tyne, ...	HADDINGTON.
Forth, ...	*North Berwick, Cockenzie, Tranent*, n., *Prestonpans*, Musselburgh, Portobello, Leith, EDINBURGH, *Newhaven, Queensferry*, Bo'ness, *Grangemouth*, all S. of the Firth; *Crail, Anstruther, St Monance, Pittenweem*, Leven, *Buckhaven, Wemyss, Dysart*, Kirkcaldy, *Kinghorn*, Burntisland, *Inverkeithing, Kincardine*, Alloa, all on N. side; STIRLING.
Leven, *l*....	Leven, *Markinch, Leslie*, KINROSS, *Milnathort.*
Orr, :	*Lochgelly.*
Esk, ...	Musselburgh, Dalkeith, *Loanhead, Penicuick.*
Almond, ..	*Whitburn.*
Lyne, *l*	Dunfermline, *Crossgates, Cowdenbeath*, n., *Oakley*, n.
Avon, ...	LINLITHGOW, Bathgate, *Armadale, Crofthead*, n.
Carron, ...	*Grangemouth, Carron, Stenhousemuir, Larbert, Larriston*, Falkirk, n., *Camelon, Dunipace, Denny.*
Black Devon, *l*	CLACKMANNAN.
Devon, *l*....	Alloa, Tillicoultry, *Dollar.*
Bannock, ..	*Bannockburn.*
Allan, *l*	*Bridge of Allan, Dunblane, Blackford.*
Teith, *l*	*Doune, Callander.*
Eden, ...	St Andrews, CUPAR-FIFE, *Falkland, Auchtermuchty.*
Tay, ...	*Ferry-Port-on-Craig*, Broughty Ferry, Dundee, *Errol*, Newburgh, PERTH, *New Scone*,
Tay (*continued*)	*Stanley, Dunkeld, Aberfeldy.*
Earn, ...	*Abernethy, Muthill*, n., Crieff, *Comrie.*
Dunning,	*Dunning.*
Ruthven,	Auchterarder.
Almond, ...	*Methven.*
Isla, *l*	*Coupar-Angus.*
Ericht, ...	Blairgowrie, *Rattray.*
Dean, *l* ..	FORFAR.
Gairie, ..	Kirriemuir.
Alyth, ...	*Alyth.*
Brothock, ...	Arbroath, *Friockheim*, n.
S. Esk, ...	Montrose, *Ferryden*, Brechin, *Southmuir*, n.
N. Esk, ...	*Marykirk.*
Luther, *l* ...	*Luthermuir*, Laurencekirk.
Bervie, ...	*Bervie.*
Carron, ...	STONEHAVEN.
Dee, ...	ABERDEEN, *Banchory, Balmoral.*
Don, ...	Old Aberdeen, Woodside, *Kintore*, Inverury.
Urie, *l*.....	Inverury, *Old Meldrum*, n.
Ythan, ...	*Ellon.*
Ugie, ...	Peterhead, *Strichen, Pitsligo.*
N. Co. Aberdeen,	Fraserburgh, *Rosehearty.*
Deveron, ...	Banff, Macduff, *Turriff*, Huntly.
Isla, *l*	Keith.
N. Co. Banff,	*Portsoy*, Cullen, Buckie.
Spey, ...	*Fochabers, Rothes, Grantown, Kingussie.*
Fiddich, ...	*Dufftown.*
Lossie, ...	*Lossiemouth, Branderburgh*, ELGIN.
Co. of Moray,	*Hopeman, Burghead.*
Findhorn, ...	Forres, n.
Nairn, ...	NAIRN.
Beauly Firth and R. Ness,	*Fort George, Avoch, Fortrose, Beauly*, INVERNESS.
Cromarty F.,	CROMARTY, *Invergordon, Alness, Evanton*, DINGWALL, *Marybury.*
Dornoch F., ..	Tain, DORNOCH.
E. Co. Sutherland,	*Golspie, Helmsdale.*
E. Co. Caithness,	*Lybster*, WICK.
Pentland Firth,	Thurso.

Basins inclined to the Atlantic.

Loch Broom,	*Ullapool.*
L. Carron, ...	*Plockton.*
Sound of Mull,	*Tobermory* (Mull).
Lochs Linnhé and Eil,	*Oban, Fort William.*

Basins inclined to the Atlantic (continued).

Rivers.	*Towns.*
Kilbrannan Sd. and L. Fyne,	Campbelton, *Tarbert*, *Lochgilphead*, INVERARY.
Clyde, F. and R.,	*Millport* (Cumbrae), ROTHESAY (Bute), AYR, *Troon*, Irvine, Saltcoats, Ardrossan, Largs, Dunoon, *Gourock*, Greenock, Helensburgh, Port-Glasgow, DUMBARTON, *Duntocher*, RENFREW, Glasgow, *Shettleston*, *Tollcross*, *Springburn*, Rutherglen, *Bellshill*, *Bothwell*, *Holytown*, n., *Low Blantyre*, Hamilton, Motherwell, n., Carluke, n., *Kirkfieldbank*, LANARK, *New Lanark*.
Doon, *l*.....	AYR, n., *Dalmellington*.
Ayr, *l*.....	AYR, *Tarbolton*, *Katrine*, *Muirkirk*, *Cumnock*.
Lugar, *l*..	*Auchinleck*.
Irvine, *l*....	Irvine, *Eglinton*, *Hurlford*, Kilmarnock, *Kilmaurs*, Galston, New Mills, *Darvel*.
Garnock,..	Kilwinning, Dalry, *Peesweep*, Kilbirnie.
Annock,..	Stewarton.
Cessnock, *l*,	*Mauchline*.
Leven, ...	DUMBARTON, Renton, Alexandria, Bonhill.
Cart, *l*.....	RENFREW, Paisley, *Nitshill*, Pollockshaws, *Busby*, *Eaglesham*.
Black Cart, *l*,	*Br. of Weir*, *Linwood*, Johnstone, Kilbarchan, *Lochwinnoch*, Beith.
Levern, *l*..	*Thornliebank*, n., Barrhead, *Neilston*.
Kelvin, *l*....	Kirkintilloch, Kilsyth, Cumbernauld, n.
W. Calder,..	*Calder*, *Calderbank*, Airdrie, Coatbridge.
E. Calder, ..	Wishaw, *Cambusnethan*, *Coltness*, n., *Shotts*.
Avon, *l*	Hamilton, Strathaven.
Nethan, *l*. ..	*Lesmahago*.
Douglas, *l*..	*Douglas*.
Girvan, ...	Girvan, *Crosshill*, Maybole.
Loch Ryan,...	Stranraer.
W. Co. Wigtown,	*Port-Patrick*, *Glenluce*.
Wigtown Bay,	*Whithorn*, WIGTOWN, *Creetown*.
Cree, ...	Newton-Stewart.
Fleet, ...	*Gatehouse*.
Dee (Solway F.),	KIRKCUDBRIGHT, *Castle-Douglas*.
Ken, *l*	Dalry.
Urr (do.), ...	*Dalbeattie*.
Nith (Solway),	MAXWELLTOWN, DUMFRIES, *Thornhill*, *Cumnock*.
Annan (do.), ..	Annan, *Ecclefechan*, *Lockerby*, n., *Lochmaben*, *Moffat*.

Lakes.—With the exception of Switzerland, there is no country in Europe more remarkable for its lakes than Scotland. They are in general very small in size, as the deep inlets of the ocean prevent any great collection of inland waters; but they are celebrated for their beauty and wild grandeur. Loch Lomond, the largest of them, 24 miles long, 8 broad, and with an area of 40 square miles, is justly famed for its splendid scenery. Arranged in the order of the river-basins in which they are situated, they are easily remembered.

Tweed Basin—*St Mary's Loch*, in Selkirkshire, drained by the Yarrow. Forth—*Loch Ard*, in Perthshire, one of the sources of the Forth; *Loch Leven*, in Kinross, drained by the Leven; and *Lochs Vennachar*, *Achray*, *Katrine*, *Lubnaig*, and *Voil*, all drained by the Teith. Tay—*Lochs Dochart* and *Tay*, in Perthshire, at the source of the Tay; *Loch Earn*, at the source of the Earn; and *Lochs Tummel*, *Rannoch*, *Erricht*, *Lydoch*, drained by the Tummel. Ness—*Ness*, *Oich*, *Garry*, and *Quoich*, in Inverness. Conan—*Glass*, *Luichart*, *Fannich*, in Ross. Oykill—*Loch Shin*, 18 miles long, in Sutherland. Naver—*Loch Naver*, in Sutherland. Ewe—*Loch Maree*, in Ross. Moidart—*Shiel*, Inverness and Argyll. Linnhé and Spean Basin—*Lochy*, *Arkaig*, and *Laggan*, in Inverness; and Lochs *Awe* and *Avich*, in Argyll, drained by the Awe. Clyde—*Loch Lomond*, drained by the Leven.

Internal Communication.—Scotland, being a highly-mountainous country, can never vie with the sister kingdom in the extent or completeness of her internal communication; yet her noble firths and estuaries, which indent the coast in all directions, give her important natural advantages; while her turnpike roads, canals, and railways, abundantly attest the energy and public spirit of her sons.

RAILWAYS.—Within the last ten years railway communication in Scotland has made extraordinary progress. In 1859 the number of miles open for traffic was 1342; in 1864 it was 2105; while in 1869 it amounted to 2600. In 1859 few railways existed beyond the central counties, or the basins of the Forth, Clyde, and Tay; but they are now numerous in the south of Scotland; while in the northern counties they penetrate the very heart of the Highlands—Golspie, in Sutherland, being the present northern terminus. The entire west, however, from Greenock to Cape Wrath, together with the county of Caithness, still remains a blank.

CANALS.—The principal are the following: *Caledonian Canal*, between the Beauly Firth and Loch Linnhé, connects the Moray Firth with the Atlantic; total length, 60 miles—but only 23 miles required to be executed, as the canal passes through Lochs Ness, Oich, and Lochy, and terminates in Loch Eil, an arm of the sea. Inverness stands near the one extremity, and Fort William near the other. *Forth and Clyde Canal*, from Glasgow to Grangemouth in Stirling, unites the Irish with the North Sea; length, 35 miles; finished in 1790, and extended from near Falkirk to Edinburgh by the *Union Canal*, finished in 1822, and 31 miles long. *Paisley Canal*, from Glasgow, through Paisley, to Johnstone in Renfrew; length, 11 miles. *Monkland Canal*, between Glasgow and Airdrie; 12 miles. *Crinan Canal*, across the isthmus of Cantyre, connects Loch Fyne with the Sound of Jura, 9 miles. The total length of canal communication in Scotland is 225 miles.

TURNPIKE ROADS.—In consequence of the excellent materials for road-making which everywhere abound, and the skill and science of Scottish trustees and surveyors, the turnpike roads of Scotland are unequalled by those of any other country. In 1829 there were 3666 miles open, and the number has been since largely increased.

National Character.—Scotchmen are characterised by many striking and well-marked peculiarities. In disposition they are grave, serious, and reflecting; in their habits frugal, industrious, and persevering; providence, honesty, and extreme caution are among their most distinguishing traits of character. They do not readily associate, and far less amalgamate, with foreigners, but will spare no amount of labour and self-denial to promote the welfare of their fellow-countrymen. They are eminently religious, deeply attached to the Presbyterian form of Church government, and strongly averse to Roman Catholicism. The annals of no other nation can show such a resolute determination in defence of civil and religious liberty. The Holy Scriptures are daily read in all the common schools, and the poorest peasant can generally read and understand them. The great and saving truths of the Bible are familiar to almost every one, and the divine code of moral law is observed by all classes of the community. The Lord's Day is universally a day of rest and religious observance; while life and property are safer than in any other country.

Literature.—Scotland, though far from being an opulent country,

and though her seats of learning are poorly endowed, has produced a cluster of names in all branches of science, philosophy, and art, that reflect on her the highest honour. The following are a few of her most eminent names:—POETRY: Ossian, Buchanan, Gawin Douglas, Drummond, Dunbar, Lyndsay, Ramsay, Tannahill, Macneill, Tennant, Hogg, Robert Burns, Thomson, Beattie, Scott, Campbell, Pollok, J. Montgomery, Prof. Wilson, Alexander Smith. HISTORY: Buchanan, Burnet, Hume, Robertson, Henry, Russell, Watson, Scott, Mackintosh, Alison, Carlyle. PHYSICAL SCIENCE: Napier, Ferguson, Gregory, Watt, Telford, Rennie, Playfair, Maclaurin, Leslie, J. Hutton, Black, Sir David Brewster, Robert Brown, Hugh Miller, John Fleming, Sir Charles Lyell, and Sir Roderick I. Murchison. MENTAL PHILOSOPHY: Reid, Hume, Kames, Stewart, Brown, Mackintosh, Adam Smith, and Sir W. Hamilton. THEOLOGY: Knox, Leighton, Burnet, Boston, Maclaurin, Macknight, Campbell, Gerard, Brown of Haddington, Halyburton, Witherspoon, M'Crie, and Thomas Chalmers. MEDICINE: Pitcairn, Munro, Gregory, Cullen, Abercrombie, W. Hunter, Baillie, Alison, Christison, A. Combe, Abernethy, J. Hunter, John Bell, Sir Charles Bell, Sir James Clark, Sir John Forbes, Liston, Lizars, Syme, Miller, and Sir James Y. Simpson. TRAVELS: Bruce, Park, Clapperton, Simpson, Sir J. Ross, Dr Livingstone, and Captain Grant. FINE ARTS: Wilkie, Nasmyth, Raeburn, Ramsay, Jameson, Sir J. N. Paton. MISCELLANEOUS: Ruddiman, Boswell, Smollett, Mackenzie, Adam, Blair, Jeffrey, Brougham, Prof. Wilson, Sir W. Scott., C. P. Smyth.

IRELAND.

Position and Boundaries.—Ireland is the second largest island in the British archipelago. The Irish Sea, with its two inlets, the North Channel and St George's Channel, form its western boundary, separating it from Great Britain; while on the remaining three sides it is bounded by the Atlantic. Lying between lat. 51° 27′ and 55° 23′ N., and lon. 5° 26′ and 10° 28′ W., the mainland occupies nearly 4° of lat. and a little more than 5° of lon.

Form, Coast-Line, and Extreme Points.—The general form is a rhomboid, the longer diagonal of which, if produced, would pass through the most easterly point of Scotland (Buchanness). The four sides are formed by lines passing through Fair Head in Antrim, Erris Head in Mayo, Mizen Head in Cork, and Carnsore Point in Wexford. Properly speaking, these are the extreme points; but Malin Head, in Donegal, is the most northern point of the mainland; Mizen Head the most southern; Dunmore Head, in Kerry, the most western; and Halbert Point, on the coast of Down, the most eastern; greatest length, 306 m.—greatest breadth, 175 m. The coast-line, which is wavy and continuous on the E., but deeply indented on the W. and N., measures about 2200 miles, being

1 mile of coast to every 15 sq. m. of surface. The eastern coast is in general low and flat, and the navigation is obstructed by numerous sand-banks and sunken rocks, which are especially numerous between Fair Head and Dublin; but the coasts along the other sides are bold and rocky, and form a noble barrier against the waves of the Atlantic.

Area and Population.—The area, according to the late Ordnance Survey, is 32,512 sq. m., being nearly two-fifths of the size of Great Britain, and one-sixteenth larger than Scotland. The population, in 1861, was 5,764,543; and in 1869, it was estimated at 5,546,343; in 1841 it was 8,066,584, showing a decrease in twenty-seven years of 2,520,000. It is only half as densely peopled as England, having 170 persons to each sq. m. The astonishing decrease during the last 27 years is mainly attributable to the famine of 1845-47, and to the immense tide of emigration that has subsequently taken place.

Political Divisions.—Ireland is divided into 4 provinces—viz., Ulster, Leinster, Munster, and Connaught; which are subdivided into 32 counties, as follows:—

ULSTER, IN THE N.E., HAS 9 COUNTIES.

Antrim.—BELFAST 122, Carrickfergus 9 (Belfast L.), Lisburn 7 (Lagan), Larne 3 (L. Larne), Ballymoney 3 n. (Bann), Ballymena 7 (Braid).

Towns from 1000 *to* 2500:—Antrim, Ballycastle, Bushmills, Legoniel, Portrush.

Down.—DOWNPATRICK 4 n., Newton-Ards 10 (L. Strangford), Newry 12 (Newry), Donaghadee 3 (E. coast), Bangor 3 (Belfast L.), Dromore 3 (Lagan), Gilford 3, Banbridge 4 (Bann).

Comber, Ballynahinch, Portaferry, Warren-Point, Rathfryland, Hillsborough, Hollywood.

Armagh.—ARMAGH 9 (Callan), Lurgan 8 n., Portadown 6 n. (Bann).

Keady, Tanderagee, Market-Hill, Newtown-Hamilton.

Monaghan.—MONAGHAN 4 (Ulster Canal).

Castle Blaney, Ballybay, Carrickmacross, Clones.

Cavan.—CAVAN 3 n. (Erne).

Kingscourt, Bailieborough, Belturbet, Cootehill.

Fermanagh.—ENNISKILLEN 6 (Erne).

Donegal.—LIFFORD 5 (Foyle), Ballyshannon 3 (Erne).

Killybegs, Raphoe, Rathmelton, Letterkenny, Donegal.

Londonderry.—LONDONDERRY 20 (Foyle), Coleraine 6 (Bann), Newtown-Limavady 3 (Roe).

Magherafelt, Maghera.

Tyrone.—OMAGH 3, Strabane 4 (Mourne), Cookstown 4 (Ballinderry), Dungannon 4 n. (Blackwater).

Newtown-Stewart, Fintona, Aughnacloy.

LEINSTER, IN THE S.E., 12 COUNTIES.

Louth.—DUNDALK 10 (Castleton), Ardee 3 (Dee), Drogheda, partly in Meath, 15 (Boyne).

Meath.—TRIM 2, Navan 4 (Boyne), Kells 3 (Blackwater).

Dublin.—DUBLIN 250 (Liffey), Blackrock 3, Donnybrook 2 n., Kingstown 12 (Dublin Bay).

Sandymount, Skerries, Swords, Rush, Balbriggan, Chapelizod.

Wicklow.—WICKLOW 3 (Vartry), Arklow 5 (Avoca), Bray 4 (Bray).

Rathdrum, Baltinglass.

Wexford.—WEXFORD 12, Enniscorthy 5 (Slaney), New Ross 6 (Barrow).

Newtown-Barry, Gorey.

Kilkenny.—KILKENNY 13 (Nore).

Thomastown, Urlingford, Castle Comer, Callan.

Queen's County.—MARYBOROUGH 3 n., Mount Mellick 3 (Barrow).

Portarlington, Abbeyleix, Mountwrath, Stradbally.

King's County.—TULLAMORE 5 n. (Cloddagh), Birr or Parsonstown 5 (Lower Brosna).

Banagher, Edenderry.

West Meath.—MULLINGAR 5 (Brosna), Athlone 6 (Shannon).

Kilbeggan, Castlepollard, Moate.

Longford.—LONGFORD 5 (Camlin).

Ballymahon, Granard.

Kildare.—ATHY 4 (Barrow), Naas 3 n. (Liffey).

Monastereven, Celbridge, Kildare, Maynooth.

Carlow.—CARLOW 8 (Barrow).

Leighlin, Tullow, Bagenalstown.

MUNSTER, IN THE S.W., 6 COUNTIES.

Waterford.—WATERFORD 23, Portlaw 4 n. (Suir), Dungarvan 6 (Dungarvan B.)

Cappoquin, Lismore, Tallow, Tramore.

Cork.—CORK 80, Macroom 3 (Lee), Queenstown 9, Middletown 3 (Cork Harb.), Skibbereen 4 (Ilen), Clonakilty 3 (Clonakilty Bay), Kinsale 4 (Kinsale Harb.), Bandon 6 (Bandon), Youghal 6, Fermoy 6, Mallow 4 (Blackwater), Mitchelstown 3 (Funcheon).

Cloyne, Bantry, Dunmanway, Millstreet, Doneraile, Buttevant, Kanturk, Charleville, W. Passage.

Kerry.—TRALEE 10 (Lee), Dingle 2 (Dingle Bay), Killarney 5 (L. Killarney).

Listowel, Cahirciveen, Castle Island, Kenmare.

Clare.—ENNIS 7 (Fergus), Kilrush 5 (Shannon).

Killaloe, Kilkee.

Tipperary.—CLONMEL 9, Carrick-on-Suir 5, Cahir 3, Cashel 4, Thurles 5 (Suir), Tipperary 6 (Arra), Nenagh 6 (Nenagh), Roscrea 4 (Lower Brosna).

Killenaule, Clogheen, Borrisocane, Fethard.

Limerick.—LIMERICK 45 (Shannon), Rathkeale 3 (Deal).

Askeaton, Croom, Kilmallock, Bruff, Newcastle.

CONNAUGHT, IN THE W., 5 COUNTIES.

Galway.—GALWAY 17 (Corrib), Tuam 5 (Clare), Loughrea 3 (L. Rea), Ballinasloe 3 (Suck).

Clifden, Athenry, Portumna, Aghrim, Gort.

Mayo.—CASTLEBAR 3 (Castlebar), Ballina 5 (Moy), Westport 4 (Clew Bay), Ballinrobe 3 (Robe).

Crossmolina, Killala, Ballaghaderreen.

Sligo.—SLIGO 10 (Garvogue).

Leitrim.—CARRICK-ON-SHANNON 2 (Shannon).

Manor-Hamilton.

Roscommon.—ROSCOMMON 3 (Suck), Boyle 3 (Boyle Water).

Castlereagh, Elphin.

Descriptive Notes.—According to the census of 1861, there were in Ireland two towns with a population above 100,000—viz., Dublin and Belfast; between 100,000 and 50,000 only one—Cork; twelve between 20,000 and 10,000—Waterford, Sligo, Galway, Drogheda, Kilkenny, Clonmell, Newry, Wexford, Newtown-Ards, Dundalk, Tralee, and Kingstown; and twenty-six between 10,000 and 5000.

ULSTER occupies the entire N. and N.E. of Ireland, and is the province nearest to Scotland, from which, at one point (Fair Head) it is only 13 miles distant. It is the most populous, and by far the most important, of the four provinces into which the kingdom is divided; area, 8555 sq. m.; population, 1,914,236. It is deeply indented by arms of the sea on the three sides exposed to the ocean, the principal indentations being Lough Strangford, Belfast Lough, Lough Foyle, Lough Swilly, and Donegal Bay. Each of these forms the estuary of a more or less extensive river-basin. The principal fresh-water lakes are Loughs Neagh and Erne. Geological character: Metamorphic rocks in the N., which are flanked with granite on the west side, and with an immense tract of trap on the east; Lower Silurian in the S.E.; carboniferous limestone in the S.W.; and Devonian in the centre. The shores are bold and rocky, with remarkable basaltic cliffs in the N. and E., the most celebrated of which is the Giant's Causeway, in the north of Antrim. Surface greatly diversified, but freer from bogs and plains than any of the other provinces of Ireland; mountainous in the W. and E.; soil fertile, upwards of three-fifths under cultivation. Ulster is the principal seat of the Irish linen manufacture, and of other branches of industry. The annual value of the linen exported is estimated at £5,000,000 sterling. The principal min-

eral products are coal, iron, copper, lead, and limestone, which are found chiefly in Cavan. The Protestant religion prevails, education is well attended to, and the people enjoy considerable comfort as compared with the other provinces. **Belfast**, generally regarded as the capital of Ulster, is the second city in Ireland in point of population, and greatly exceeds Dublin in manufacturing industry, especially in the linen and cotton manufacture. It has considerable foreign trade, and extensive intercourse with the west coast of Great Britain, especially with Liverpool and Glasgow, and is the seat of one of the "Queen's Colleges." **Carrickfergus**, with cotton and linen manufactories, and near it an extensive saltmine discovered in 1852. **Lisburn**, a handsome and populous town; a canal from Lough Neagh here joins the Lagan. **Ballymena**, in the centre of an industrious, manufacturing, and agricultural district, is an active and thriving town. **Downpatrick**, the capital, is one of the most ancient towns in Ireland; its holy wells are resorted to by Roman Catholic pilgrims. **Newry**, the largest town in the county, is a flourishing seaport, with considerable linen and cotton works. **Armagh**, the ecclesiastical capital of Ireland, with an observatory and two cathedrals. **Lurgan** and **Portadown**, with manufactories of linen and cotton goods. **Monaghan**, on the Ulster Canal, which unites Loughs Neagh and Erne, trades extensively in linen and pigs. **Cavan**, the head of a poor-law union, has some local traffic. **Enniskillen**, delightfully situated in an island in L. Erne, carries on a considerable trade in linen; in its townhall are still preserved the banners borne by the Enniskilleners at the celebrated battle of the Boyne, July 1, 1690. **Ballyshannon**, near the mouth of the Erne, with a salmon-fishery. **Londonderry**, an ancient, flourishing, and walled city on the Foyle, famous for the siege so heroically sustained against the army of James II. in 1689. **Coleraine** is one of the principal markets for the Ulster linen manufactures. **Omagh**, a small town with trade in linen and corn. **Dungannon**, the ancient residence of the kings of Ulster, has a brisk linen trade.

LEINSTER occupies the entire S.E. of Ireland; area, 7472 sq. m.; population, 1,457,635. The shores are less indented than in Ulster, the principal inlets being Dundalk and Dublin Bays and Wexford Haven: the principal rivers are the Dee, Boyne, Liffey, Slaney, and Barrow: the basins of the Shannon and Suir also belong partially to this province. By far the largest portion is covered with mountain limestone, but there are considerable tracts of Lower Silurian along the east coast, enclosing a huge belt of granite, which extends in a S.W. direction from Dublin Bay to the junction of the Barrow and Nore. Surface generally level, but one mountain region in the E. and another in the W.; soil fertile and well cultivated, and producing more wheat than any other province: possesses superior facilities for internal communication by means of its large rivers; but has fewer good harbours than any of the other provinces. At the time of the Anglo-Norman invasion the province was divided into two petty sovereignties—viz., those of Leinster and Meath. **Dundalk**, at the head of a bay of same name, has various manufactures and important fisheries. **Drogheda**, a flourishing town on the Boyne, and near the scene of the celebrated battle of that name, which proved so fatal to the pretensions of the Stewarts in Ireland. **Trim**, a small town on the Boyne; near it Dangan, said by some to be the birthplace of the late Duke of Wellington. **Navan**, with a good export trade in agricultural produce. **Dublin**, the capital of Ireland and one of the finest cities of Europe, has a quarter of a million inhabitants, and numerous magnificent public buildings, among which is Trinity College, a Protestant university

founded in 1591 by Queen Elizabeth. Adjoining the city is Phœnix Park, containing the residence of the Lord-Lieutenant, her Majesty's representative in Ireland. **Kingstown**, the port of Dublin, with an excellent harbour and extensive commerce, is the mail-packet station to Liverpool and Holyhead. **Wicklow**, a resort of sea-bathers, exports copper-ore and corn. **Wexford**, a considerable town, with exports of cattle and dairy produce, has extensive quays and dockyards. **Enniscorthy**; near it is Vinegar Hill, where the Irish rebels were defeated by Lord Lake in 1798. **New Ross**, a flourishing town, with considerable export trade in agricultural produce. **Kilkenny**, a considerable town, the second in population in the province; the streets are paved with black marble, which is quarried in the vicinity; here is a grammar school, in which Swift, Congreve, and Berkeley received the early part of their education. **Maryborough** consists for the most part of miserable cabins, with a few fine houses. **Tullamore**, the principal shipping station on the Grand Canal. **Birr**, a thriving town, famous for Lord Rosse's monster telescope, one of the greatest achievements of modern science. **Mullingar**, on the Royal Canal, is noted for its great cattle and wool markets. **Athlone**, the principal military station in the west of Ireland, has considerable local trade. **Longford**, on the Camlin, a busy, thriving little town; near it was born Oliver Goldsmith in 1728. **Athy**, on the Barrow, has considerable trade in corn, butter, and malt. **Maynooth**, with a far-famed Roman Catholic college. **Carlow**, with a Roman Catholic cathedral and college, has considerable trade in agricultural produce.

MUNSTER is situated in the S.W. of Ireland, and is the largest of the four provinces; area, 9474 sq. m.; population, 1,013,558. The coasts are very deeply indented on the W. by the estuary of the Shannon, Dingle Bay, Kenmare River, and Bantry Bay. The principal river-basins are those of the Suir, which enters Waterford Harbour; the Blackwater; the Lee, which enters Cork Harbour; the Bandon, which enters Kinsale Harbour (all of which incline to the S.E.); and the Shannon basin in the N.W., only partially in this province. It consists of mountain limestone and millstone-grit in the W., Devonian strata in the S., and Upper Silurian in S.W. Surface highly diversified; two ranges of mountains, the southernmost of which contains the loftiest summits in the kingdom, extend nearly across the province from E. to W., enclosing the basin of the Blackwater: the extensive plain of Tipperary, Limerick, and Cork, occupies a large portion of the surface. Soil various, two-thirds being arable, and a great portion under bog, which is easily reclaimed. Coal is found in Tipperary, Kerry, and Cork; but there are few minerals exported, though the harbours are excellent. The population belongs almost exclusively to the Roman Catholic Church. At the time of the Anglo-Norman conquest, the province was divided into the two petty kingdoms of North and South Munster. **Waterford**, a large and thriving city on the right bank of the Suir, has a great foreign and coasting trade, the exports alone being valued at £4,000,000 annually. **Cork**, built on an island in the Lee, is the principal city in Munster, and in population is only exceeded by Dublin and Belfast. Cork is the seat of one of the recently erected Queen's Colleges. In 1868, 3630 vessels, carrying 839,220 tons, entered and cleared. Its manufactures are numerous, and shipbuilding is extensively carried on. **Queenstown**, formerly **Cove of Cork**, derived its present name from the visit of Queen Victoria in 1849: is protected by batteries and fortifications. **Kinsale**, a fashionable watering-place, with valuable fisheries. **Youghal**, on the Blackwater, with valuable salmon-fisheries: here Sir Walter Raleigh first introduced the culture of the

potato. **Fermoy**, with infantry barracks and flour-mills. **Tralee**, near the head of Tralee Bay, is the seat of a brisk trade in grain and flour. **Dingle**, the westernmost town in the British Isles. **Killarney**, on a lake of same name, famous for its enchanting scenery, and now accessible by rail from Dublin, is a favourite resort for tourists. **Ennis**, with a Gothic abbey, which is reckoned the finest in Ireland, has quarries of fine black marble in the neighbourhood. **Clonmel**, partly in Waterford, a considerable town with extensive manufactures, is the b. p. of Sterne, author of 'Tristram Shandy.' **Carrick-on-Suir**, with a bridge of twenty arches over the river, and an export trade in corn and cotton. **Cashel**, once the capital of the kingdom of Munster, is an ancient episcopal city, with Cormac's Chapel standing on the celebrated "Rock of Cashel," and one of the most remarkable ruins in Ireland. **Thurles** contains a Roman Catholic college and two episcopal palaces. **Tipperary**, on the Waterford and Limerick Railway, is beautifully situated, and is a well-built and thriving town. **Nenagh**, a thriving town, with a good local trade. **Limerick**, a large and populous city on the Shannon, at the head of its noble estuary, is a place of great antiquity, and the fourth largest city in Ireland; was a royal seat of the kings of Thomond before the conquest of Ireland. At the time of the Revolution it was the chief stronghold of the cause of James II., but capitulated to the troops of William III. in 1691; has railway communication with all parts of the kingdom, with great export and import trade, and considerable manufactures of beautiful lace.

CONNAUGHT, the smallest, least populous, and most westerly of the Irish provinces, lies N. of Munster and W. of Leinster, from which it is for the most part separated by the Shannon; area, 6862 sq. m.; population, 913,135. The west side is broken up into numerous peninsulas, the largest of which is Connemara, and is lined by a great many islands. The principal indentations are Galway, Clew, Blacksod, Killala, and Sligo Bays; and the chief river-basins are those of the Shannon (in part), Corrib, Moy, and Arrow. Principally mountain limestone; but a large tract of metamorphic and Silurian strata in the W., and extensive patches of Devonian in various parts. Surface mountainous in the W., and hilly in the N. and S., while the centre consists of an extensive level plain. Soil various, moderately fertile, full of peat-bogs, but nearly a half is arable. Minerals and manufactures unimportant: but coal is found in the Lough Allan district. The inhabitants belong for the most part to the native Irish or Celtic stock, retain their ancient language, adhere to the Roman Catholic religion, and are sunk in the deepest poverty and ignorance. Connaught was formerly one of the kingdoms of the Irish heptarchy, and remained unconquered long after the rest of Ireland had yielded to the English arms. **Galway**, at the head of Galway Bay, may be regarded as the capital of Connaught, it being the only important town in the province, and the chief seaport of the west of Ireland. It is 105 miles west from Dublin, with which it is connected by railway. Galway is very ancient; was conquered by the Anglo-Normans in 1230; had a flourishing trade with Spain in the middle ages, and many of the houses are erected after the Spanish model. It is the seat of one of the Queen's Colleges. **Tuam**, an episcopal city, with a Roman Catholic college, named St Jarlath, is the see of the primate of Connaught. **Ballinasloe** has a large annual fair, which lasts five days. **Castlebar**, a small inland town, has some trade in linen. **Ballina**, with manufactures of snuff, and salmon-fisheries. **Sligo**, a considerable town on the Garvogue, has a good colonial and foreign trade. Three ships of the Spanish Armada were stranded here in 1588. **Carrick-on-Shannon**, at the confluence of the

Shannon and Boyle, is a very small town, with little trade. **Roscommon**, on a tributary of the Shannon, has some woollen manufactures, and an increasing corn trade.

Capes.—Beginning at the extreme N., and proceeding E.-ward, the principal capes and headlands are the following:—Malin Head, in Donegal, the N.-most point of the mainland; Bangore Head and Fair Head, in Antrim;* Howth Head, in Dublin; Wicklow Head, in Wicklow; Carnsore Point, in Wexford; Cape Clear, on an island, the most southern point of Ireland; Mizen Head and Crow Head, in Cork; Dunmore Head, in Kerry, the most westerly point of the mainland; Kerry Head and Loop Head, on either side of the estuary of the Shannon; Slyne Head, in Galway; Achil Head and Urris Head, in Mayo; Rossan Point and Bloody Foreland, in Donegal.

Islands.—The islands are in general very small, and close to the mainland.† Following the same order as in the last paragraph, we have:—Rathlin, N. of Antrim; Copeland, N.E. of Down; Lambay and Ireland's Eye, E. of Dublin; Saltee I., S. of Wexford; Cove, in Cork Harbour; Cape Clear and Bear Is., S.W. of Cork; Valentia‡ and Blasket Is., W. of Kerry; Arran Is., in Galway Bay; Garomna, and several others, S. of Galway; Innis Bofin, Innis Turk, Clare, and Achil Is., W. of Connaught; Arranmore and Tory Is., W. of Donegal.

Bays and Estuaries.—These are very numerous, especially in the N. and W., where they penetrate far into the land. On the coast of Ulster these inlets are termed *loughs*, a word of the same sound and signification as the *lochs* of the opposite coasts of Scotland. Beginning at the N., and following the coast-line E.-wards, the following are the principal bays, &c.:—

Coast of Ulster.—Loughs Swilly, Foyle, Belfast, Strangford; Dundrum B., Carlingford B. *Coast of Leinster.*—Dundalk B., Dublin B., Wexford Harbour. *South Coast of Munster.*—Waterford, Dungarvan, Youghal, Cork, and Kinsale Harbours. *West Coast of Munster.*—Bantry B., Kenmare River, Dingle B., Tralee B., Estuary of the Shannon. *Coast of Connaught.*—Galway B., Clew B., Blacksod B., Killala B., Sligo B., and Donegal B., between Connaught and Ulster.

Mountain System.—The Irish mountains form an immense circular ring along the coast, enclosing the great central basin of the kingdom. This plain extends from Dublin to Galway, and from the shores of Lough Neagh to Waterford: its highest elevation is about 320 feet; it comprises a large tract of bog-land, and is traversed by only a few low ranges of hills. The ranges separating the central

* Fair Head is only 13 miles distant from the Mull of Cantyre, in Scotland. A little to the west of Bangore Head is the celebrated Giant's Causeway, a basaltic promontory projecting into the sea, resembling a pier, 700 feet in length, 350 feet in breadth, and 30 feet in height. It is separated by trap-dykes into three divisions, comprising in all about 40,000 polygonal columns, each consisting of several pieces, the joints of which are articulated with the greatest nicety.

† Altogether 5000 islands and rocks are enumerated as belonging to Ireland, of which 245 were found inhabited at the date of the last census.

‡ Valentia Island is the eastern terminus of the great submarine telegraph to Newfoundland.

plain from the ocean are not continuous, but broken up into a number of isolated masses, none of which attain to any great elevation—Carran Tual, in Macgillicuddy Reeks, county Kerry, the culminating-point of Ireland, being 3414 feet high. Beginning at the S.E. corner of Ulster, and proceeding N. and W., the following are the principal ranges :—

Mourne Mountains, in Down, between the Newry and Lagan; highest summits—Slieve-Donard, 2796; Mt. Eagle, 2084 feet.

Glenocum Mountains, in Antrim, separating the basins of the Lagan and Bann, and extending from Belfast to Fair Head; Mt. Trostan, 1817; Mt. Devis, 1568 feet.

Carntogher Mountains, in Londonderry, between the Bann and the Foyle; Mt. Sawell, 2236 feet.

Mountains of Donegal, between the Foyle and the Atlantic; Mt. Errigal, 2466 feet; Blue Stack, 2219 feet.

Nephin-Beg Mountains, in Mayo, between the basin of the Moy and west coast; Mt. Nephin, 2646 feet; Nephin-Beg, 2065 feet.

Mountains of Connemara, south of Clew Bay, and between the basin of the Corrib and west coast; Muilrea, 2688; Croagh Patrick, 2510; Twelve Pins, 2395 feet.

Mountains of Clare, between Galway Bay and Estuary of the Shannon; Mt. Callan, Slieve-Boughty.

Mount Brandon, 3127 feet—the second highest mountain in Ireland—between basin of Shannon and Dingle Bay.

Macgillicuddy Reeks, in Kerry, between Dingle Bay and Kenmare River; Carran Tual, W. of Lake Killarney—the highest mountain in Ireland—3414 feet; Mangerton, S.E. of Lake Killarney, 2756 feet.

The *Muskerry, Bogragh, and Neagh Mountains*, in Cork, between the basins of the Blackwater and the Lee.

Mountains of Tipperary and Waterford, between the basins of the Blackwater and the Suir; Galteemore, 3007; Knockmelledown, 2598.

Blackstairs Mountains, in Wexford, between the basins of the Barrow and the Slaney; Mt. Leinster, 2610 feet.

Mountains of Wicklow, between the Slaney and Liffey; Lugnaquilla, 3039; Kippur, 2473 feet.

Slieve-Bloom Mountains, in the interior of the Great Plain, separate the basin of the Shannon from that of the Barrow and Suir; Mt. Keeper, 2278 feet.

The line of perennial congelation in the latitude of Carran Tual is about 6000 feet high. Hence, if Mangerton were piled atop of the loftiest mountain in Ireland, it would be capped with snow all the year round.

River-Basins.—The principal axis of Ireland extends in a N.E. direction from Mizen Head, in Cork, to Fair Head, in Antrim. The twelve principal river-basins are equally divided by this line, six of them (Shannon, Corrib, Moy, Erne, Foyle, and Bann) inclining from it in a general westerly direction towards the Atlantic, and the remaining six (Boyne, Liffey, Slaney, Barrow, Blackwater, Lee) in a general easterly direction towards the Irish Sea and the openings leading into it. The twelve basins contain twenty-six out of the thirty-two county towns, and occupy about $\frac{3}{4}$ of the entire surface. The five largest basins are the Shannon (area, 7000 sq. m.), Erne, Foyle,

Bann, Barrow, and Suir; they contain twenty county towns and 16,300 square miles, or one-half of the entire surface.

Table of Rivers and Towns.—The arrangement adopted in the following table is the same as in the corresponding sections treating of England and Scotland: we begin with the river on which the capital stands, and proceed northwards along the coast—that being the direction followed in the river-system of Great Britain. Large towns are printed in Roman letters, and denote here such as contain 2500 inhabitants and upwards; small towns, or those printed in *Italics*, denote those containing not less than 1000 inhabitants; while county towns are in SMALL CAPITALS. Ninety rivers are given in the table, and of these 30 enter the ocean directly, the other 60 being their tributaries; and 230 towns, only 100 of which have a population amounting to 2500, all the others ranging between that number and 1000.

Basins inclined to the Irish Sea.

Rivers.	*Towns.*
Liffey & Dublin B.,	Kingstown, *Blackrock*, *Donnybrook*, n., *Sandymount*, DUBLIN, *Chapelizod*, *Celbridge*, Naas, *Kildare*, n.
Rye, *l*	*Maynooth.*
Co. of Dublin,	*Swords*, *Rush*, *Skerries*, *Balbriggan.*
Boyne,	Drogheda, Navan, TRIM, *Edinderry.*
Blackwater, *l*	Navan, Kells.
Moynalty, *l*	*Bailieborough.*
Dee,	Ardee.
Glyde,	*Carrickmacross*, *Kingscourt*, n.
Castleton,	DUNDALK.
Carlingford B. and Newry,	*Carlingford*, *Warren Point*, Newry, *Rathfryland.*
L. Strangford & R. Quoile,	*Portaferry*, *Comber*, Newtown-Ards, DOWNPATRICK, *Ballynahinch.*
Co. of Down,	Donaghadee.
L. Belfast and R. Lagan,	Bangor, Carrickfergus, *Holywood*, BELFAST, Lisburn, *Hillsborough*, Dromore.
L. Larne,	Larne.

Basins inclined to the Atlantic.

Ballycastle B.,	*Ballycastle.*
Bush,	*Bushmills.*
N. coast,	*Portrush.*
Bann, and L. Neagh,	Coleraine, Ballymoney, n., Antrim, Lurgan, n., Portadown, *Tandragee*, Gilford, Banbridge.
Moyola, *l*	*Magherafelt*, *Maghera.*
Main,	*Randalstown.*
Braid, *l*	Ballymena.
Ballinderry, *l*	Cookstown.
Blackwater, *l*	Dungannon, n., *Auchnacloy.*
Ulster Canal,	Callan, ARMAGH, *Keady*, n. MONAGHAN.
Foyle (L. Foyle),	LONDONDERRY, LIFFORD, Strabane.
Roe,	Newtown-Limavady.
Deel, *l*	*Raphoe.*
Mourne,	Strabane, *Newtown-Stewart*, OMAGH, *Fintona*, n.
Swilly, L. and R.,	*Rathmelton*, *Letterkenny.*
Donegal B. & R. Erne,	*Killybegs*, *Donegal*, Ballyshannon, ENNISKILLEN, *Belturbet*, CAVAN, n.
Wattle,	*Clones*, n.
Annalee,	*Cootehill*, n.
Garvogue and Bonnet,	SLIGO, *Manor-Hamilton.*
Moy,	*Killala*, Ballina.
Deel, *l*	*Crossmolina.*
	Castlebar, CASTLEBAR.
Clew Bay,	Westport.
W. Co. of Galway,	*Clifden.*
Corrib (Galway Bay),	GALWAY.
Clare, *l*	Tuam.
Robe, *l*	Ballinrobe.
Clarin,	*Athenry.*
Cooter,	Gort, Loughrea, n.

Basins inclined to the Atlantic (continued).

Rivers.	*Towns.*
Shannon (L. Allen),	*Kilkee*, Kilrush, LIMERICK, *Killaloe, Borrisocane, Portumna, Banagher*, Athlone, CARRICK-on-Shannon.
Fergus,	ENNIS.
Deel, *l*	*Askeaton*, Rathkeale, *Newcastle.*
Maig & Loo, *l*	*Croom*, Charleville, *Kilbamallock, Kilfinnan.*
Star,	*Bruff.*
Nenagh, *l*	Nenagh.
Lower Bros-na, *l*	Birr, Roscrea.
Brosna, *l*	Moate, MULLINGAR.
Cloddagh, *l*	TULLAMORE.
Suck,	Ballinasloe, ROSCOMMON, *Castlereagh.*
Inny, *l*	*Ballymahon, Granard*, n.
Camlin, *l*	LONGFORD.
Bodarg,	*Elphin.*
Boyle (L. Gara),	CARRICK-on-Shannon, Boyle.
Feale,	*Listowel, Abbeyfeale.*
Tralee Bay,	TRALEE.
Dingle Bay & Main R.,	Dingle, *Cahirciveen, Castlemain, Castle I.*
Leane, *l*	Killarney.
Kenmare Riv.,	*Kenmare.*
Bantry Bay,	Bantry.

Basins inclined to the Irish Sea (continued).

Ilen,	Skibbereen.
Clonakilty B.,	Clonakilty.
Bandon,	Kinsale, Bandon, *Dunmanway.*
Cork H. and R. Lee,	Queenstown *Cloyne*, n., Middleton, n., *W. Passage*, CORK, Macroom, n.
Sullane, *l*	Macroom.
Blackwater,	Youghal, *Cappoquin, Lismore*, Fermoy, Mallow, *Millstreet.*
Bride,	*Tallow.*
Funcheon, *l*	Mitchelstown.
Awbeg, *l*	Doneraile, *Buttevant.*
Allow, *l*	*Kanturk.*
Dungarvan B.,	Dungarvan.
Tramore Bay,	*Tramore.*
Suir,	WATERFORD, Portlaw, n., Carrick-on-Suir, CLONMEL, Cahir, Cashel, Thurles, Templemore, n.
Honor, *l*	*Fethard, Killenaule*, n.
Tar,	*Clogheen.*
Arra,	Tipperary.
Barrow,	New ROSS, *Leighlin Bridge*, CARLOW, ATHY, *Monastereven, Kildare*, n., *Portarlington*, MARYBOROUGH, Mount Mellick.
Nore,	*Thomastown*, KILKENNY, *Abbeyleix, Mountrath.*
King's R.,	*Callan, Urlingford.*
Dinan, *l*	*Castle Comer.*
Strad,	*Stradbally.*
Figale, *l*	*Monastereven.*
Slaney,	WEXFORD, Enniscorthy, *Newtown-Barry, Tullow, Baltinglass.*
Bann,	*Gorey.*
Avoca,	Arklow, *Rathdrum.*
Vartry,	WICKLOW.
Bray,	Bray.

Lakes.—The Irish lakes or *loughs* are numerous, and some of them extensive. Lough Neagh, in Ulster, is the largest in the British Isles: it is 17 miles long, 10 broad, and has an area of 153 sq. miles: its waters are celebrated for their petrifying quality. The other principal lakes are Corrib, Erne, Derg, Ree, Mask. The total area of all the Irish lakes is estimated at 984 sq. miles. All the important lakes are found in the principal river-basins enumerated at p. 170. Following the order there given, we find in the basin of the

Shannon—*Loughs Derg, Ree, Boffin, Corry*, and *Allen*, in the line of the main river; *Loughs Ennel* and *Owel* on the Brosna; *Loughs Dereveragh* and *Sheelin* on the Inny; and *Loughs Key* and *Gara* on the Boyle. Corrib—*Loughs Corrib* and *Mask*. Moy—*Loughs Conn* and *Cullin*. Erne—*Loughs Erne, Oughter*, and *Gounagh*. Foyle—*Lough Derg*, containing

St Patrick's Purgatory on an island. Bann—*Lough Neagh*, largest in the United Kingdom. Boyne—*Lough Ramor*. Dingle and Main Basin—*Lakes of Killarney*, in Kerry, drained by the Leane, and, being surrounded by the loftiest mountains in Ireland, are celebrated for their romantic scenery.

Internal Communication.—Owing to the absence of mountain-chains in the interior, and the many deep indentations of the coast, Ireland possesses great natural facilities for carrying on her internal communication; but until recently, little has been done in opening up the country by the construction of the highways of commerce.

RAILWAYS.—In January 1868 there were 1794 miles open for traffic, which cost £24,891,000; and the total receipts for passengers and goods for the year then ending were £1,500,000. The railway system is still far from being complete. Dublin is the centre of the greater part of them.

NAVIGABLE RIVERS.—The Shannon is navigable from the sea to L. Allen, a distance of 214 miles; the Bandon, 15; the Blackwater to Fermoy; the Suir to Clonmel, 40; the Barrow to Athy, 60; the Nore to Thomastown, 28; the Slaney to Enniscorthy, 15; the Boyne to Navan, 25; the Lagan to Lisburn; the Bann to Coleraine, 5; the Foyle to Strabane, 20; Erne to Ballyshannon, 5.

CANALS.—The mileage of canal amounts to 357 miles. The Grand Canal, from Dublin to Banagher on the Shannon, connects the Irish Sea with the Atlantic, 164 miles. Royal Canal, from Dublin to a point in the Shannon a little above Lough Rea, 92 miles. Newry Canal unites the river Newry with the Upper Bann, thus connecting Carlingford Bay with Lough Neagh, 12 miles. Lagan Canal, from Belfast to Lough Neagh, 20 miles. Ulster Canal, from Charlemont on the Blackwater, a feeder of the Upper Bann, to Lough Erne, by Monaghan and Clones, 46 miles. Boyne Canal, from Drogheda to Navan, 25 miles.

ELECTRIC TELEGRAPH.—Four lines of submarine telegraph connect Ireland with Great Britain (Holyhead to Dublin; Milford Haven to Wexford; Stranraer to Carrickfergus; Portpatrick to Donaghadee). Electric wires are also laid in connection with all the principal railway lines. In 1858 the first submarine telegraph, connecting the Old World with the New, was completed. The eastern terminus of the telegraph is in Valentia Harbour, county Kerry, and the western at Heart's Content, Trinity Bay, Newfoundland. It continued in working order, however, for only a few months, and is now abandoned. Another cable, between the same termini, was laid in 1865, and a third in 1866, both of which are now in excellent order.

National Character.—The native Irish belong to the Celtic race, and are characterised by all the peculiarities which distinguish it from the other branches of the Caucasian family, some of which they exhibit in an extreme degree. They are remarkable for quickness and intelligence, but the brilliancy of their imagination and their unrivalled wit are more striking than their depth of thought or power of patient investigation. Their wit is so peculiar and *sui generis*, that it is quite inimitable by all save the natives of the Emerald Isle. They are singularly warm-hearted and hospitable, and, when well educated and refined, form the most agreeable asso-

ciates. Their prevailing vices are rashness, improvidence, and a disposition to riotous excitement; and, when under the influence of spirituous liquors, they are frequently regardless of human life. They have always manifested a strong aversion to English rule, and have had too many causes for evincing a spirit of insubordination: but a better day is beginning to dawn over this unfortunate though beautiful country.

Literature.—Ireland could boast of a written literature long before the sister island. Not a few Irish MSS. still extant are supposed to have been written as early as the sixth century. The famous Psalter of Cashel, though not compiled till the ninth century, contains many compositions of a much older date; and the same remark holds true in regard to the valuable collection of ancient Irish records made by Tighernach and other annalists in the eleventh and twelfth centuries. These were printed and published by the Rev. Charles O'Connor in 1814-26, both in the original and with a Latin translation. The largest known collections of Irish MSS. are those in the library of Trinity College, Dublin, and those formerly in that of the Duke of Buckingham, at Stowe. Of the few works that have appeared in Irish, in recent times, are Keating's 'Chronological History of Ireland,' and the translation of the Bible, executed in 1681. As the Irish language was rarely studied by scholars of other countries, learned Irishmen generally wrote in the Latin tongue in early times, and in English at a subsequent period. Among the latter may be mentioned the following:—POETRY: Dean Swift, Oliver Goldsmith, J. Barry, Wolfe, Moore. HISTORY: Keating, Leland, O'Hallaran. MENTAL AND MORAL SCIENCE: Bp. Berkeley, Hutcheson. THEOLOGY: Archbp. Usher, Dr Adam Clarke, W. B. Kirwan, Archbp. Magee. NATURAL SCIENCE: Sir Hans Sloane, Sir W. R. Hamilton, R. Kirwan, Goldsmith, Sir D. Barry, R. Murphy, Lord Rosse. ORATORS AND STATESMEN: Canning, Sheridan, Burke, Grattan, Curran, Daniel O'Connel, Lord Macartney, Lord Plunket. NOVELISTS AND DRAMATISTS: Sir R. Steele, Sterne, O'Hara, Griffin, Arthur Murphy, O'Keeffe, Carleton, Knowles, Lever. FINE ARTS: Lover, M. Kelly, Sir J. A. Stevenson. TRAVELS: R. O'Hara, Burke, Maclure, M'Clintock. MISCELLANEOUS: S. Barry, Malone, E. Quin, Maginn, J. W. Croker, J. C. Croker.

SPAIN AND PORTUGAL.

Position and Boundaries.—Spain and Portugal, otherwise called the Iberian or Spanish Peninsula, occupies the extreme S.W. corner of Europe. It is bounded on the N. by the Pyrenees and the Bay of Biscay, which separate it from

France; on the W. by the Atlantic; and on the S. and E. partly by the Atlantic and partly by the Mediterranean and Strait of Gibraltar, which separate it from Africa. The Peninsula lies between the parallels of 36° 1′ and 43° 45′ N., and between the meridians of 9° 32′ W. and 3° 20′ E.; thus occupying 7¾° of latitude and nearly 13° of longitude. Madrid, near the centre of the Peninsula, is nearly on the same parallel as Naples, Bokhara, Pekin, Great Salt-Lake City, and New York, and nearly on the same meridian as Edinburgh, Exeter, L'Orient, Ivory Coast, and St Helena.

Form, Coast-Line, and Extreme Points.—Except for a considerable prolongation in the extreme N.E., the form of the Peninsula is nearly a square, whose longest diagonal, from Cape St Vincent to Cape Creuse, measures 650 miles; and the shortest, from Cape Ortegal to Cape de Gata, 525 miles. The extreme points are—Cape Roca, near Lisbon, the most westerly point of the continent, and Tarifa Point, near Gibraltar, the most southerly; Cape Ortegal in Galicia and Cape Creuse in Catalonia are the extreme N. and E. points. Surrounded by the ocean on all sides except the N.E., the sea-margin is necessarily large; but the ocean nowhere penetrates the land very deeply, and there are extensive tracts in the interior at a great distance from the sea. The entire coast-line is estimated at 2300 miles, of which 1800 belong to Spain and 500 to Portugal; being 1 mile of coast to each 98 miles of surface—a ratio greatly inferior to that of the other European peninsulas, all of which are deeply indented by the sea.

Area and Population.—The area of the Peninsula alone is 227,420 sq. miles, or considerably more than the area of France; 190,936 miles belong to Spain, and 36,484 to Portugal. Including the Balearic and Canary Isles, the area of Spain is 195,914 sq. miles; and that of Portugal, including the Azores and Madeira, 37,965 sq. miles. Hence the area of Spain and Portugal, including the islands, is nearly double that of the Brit. Isles. In May 1864 the total population of Spain amounted to 16,302,625, of which half a million belonged to the islands. The population of Portugal, in 1863, amounted to 3,287,675, of which 364,000 belonged to Madeira and the Azores. Hence the entire population of the Peninsula with its islands only slightly exceeds the population of England and Wales in 1861, though the area is four times greater. In the beginning of the fourteenth century the population of the Peninsula was greatly denser than at present, that of Spain alone having been estimated at nearly 22,000,000; but in the four subsequent centuries it declined to little more than 5,000,000. It is now again advancing, though very slowly. In the first half of the present century it increased about 40 per cent, the population of 1803 having been estimated at 10,351,000. The numerous wars in which Spain has been engaged, the loss of her colonies and commerce, the want of water in the interior, the indolence of the inhabitants, and, above all, the blighting agency of her

religion, account in a great measure for the stationary and frequently retrograde condition of the population. The population of Portugal has increased considerably during the century.

Political Divisions.—Previously to 1833, Spain was divided into fifteen, or, including Granada, into sixteen provinces, many of which were called kingdoms. These were then subdivided into forty-nine new provinces (including the Balearic Isles and the Canaries), which, in general, bear the names of their respective capitals. The three Basque provinces, however, and Navarra, retain their former names. The following is a list of the old provinces, with their capitals, showing the new provinces into which they have been partitioned :—

Old Provinces.	Capitals.	New Provinces.
Guipuzcoa	Tolosa	Guipuzcoa.
Biscaya	Bilbao	Biscaya.
Alava	Vitoria	Alava.
Asturias	Oviedo	Oviedo.
Galicia	Santiago de Compostella	Lugo, Coruña, Pontevedra, Orense.
Leon	Leon	Leon, Zamora, Salamanca.
Estremadura	Badajos	Caceres, Badajos.
Andalucia	Seville	Sevilla, Cordova, Jaen, Huelva, Cadiz.
Granada	Granada	Granada, Almeira, Malaga.
Murcia	Murcia	Murcia, Albacete.
Valencia	Valencia	Alicante, Valencia, Castellon-de-la-Plana.
Catalonia	Barcelona	Tarragona, Barcelona, Gerona, Lerida.
Aragon	Zaragoza	Huesca, Zaragoza, Teruel.
Navarra	Pamplona	Navarra.
Old Castile	Burgos	Santander, Logrono, Burgos, Palencia, Valladolid, Soria, Segovia, Avila.
New Castile & La Mancha	Madrid	Madrid, Guadalaxara, Cuenca, Toledo, Ciudad Real.

The forty-seven continental provinces are most conveniently arranged as follows :—

Seven north-western provinces, fronting the Bay of Biscay. Seven western, embracing Leon, Estremadura, and part of Galicia. Eight southern, embracing Andalucia and Granada. Seven eastern, comprising Murcia, Valencia, and a part of Catalonia. Six north-eastern, containing the remainder of Catalonia, Aragon, and Navarra. Twelve central, embracing Old and New Castile, with La Mancha. In the following lists, towns of above 10,000 inhabitants are put in large type, and those ranging between 10,000 and 5000 in small.

SEVEN NORTH-WESTERN PROVINCES.

Guipuzcoa.*—TOLOSA 5 (Orria), San Sebastian 19 (Urumea). Towns between 5000 and 10,000 inhabitants. Fuenterrabia.

Biscaya.—BILBAO 25 (Nervion).

Alava.—VITORIA 16 (Zadorra, *affl.* of the Ebro).

Santander.—SANTANDER 30 (Miera).

Oviedo.—OVIEDO 28 (Nalon), Gijon 7, Aviles 6 (N. coast).

Lugo.—LUGO 7 (Minho), Mondonedo 6 (Masma).

Coruña.—CORUÑA 30 (Mero), Ferrol 17 (W. coast), Padron 6, Santiago de Compostella 27 n. (Ulla).

SEVEN WESTERN PROVINCES.

Pontevedra.—PONTEVEDRA 5 (Lerey), Vigo 8 (Ria de Vigo).

Orense.—ORENSE 5 (Minho).

Leon.—LEON 6 (Bornesga).

Zamora.—ZAMORA 10, Toro 8 (Douro), Benavente 12 (Esla).

Salamanca.—SALAMANCA 15 (Tormes), Ciudad Rodrigo 5 (Agueda).

Caceres.—CACERES 12 (Caceres).
Garrobillas, Placentia, Trujillo, Montanches, Alcantara.

Badajos.—BADAJOS 23, Olivenca 10, Don Benito 15, Villanueva de Serena 10 (Guadiana).
Xeres de los Caballeros, Albuquerque, Villafranca, Llerena, Cabeza del Buey, Castuera, Fregenal de la Sierra.

EIGHT SOUTHERN PROVINCES.

Sevilla.—SEVILLA 118 (Guadalquivir), Utrera 13 n. (Salado), Moron

* The following rules will materially assist in pronouncing Spanish words :—
ce, ci = *th* in thin: as Caceres, Ciudad (*Cā'-the-res, Thī-ū'-dad*).
ch = *tch*, or *ch* in Church; never *sh*, as in Portuguese and French.
d, precisely the same as in English, but in some of the provinces of Spain, *d*, between two vowels, = *th* in this: thus Mondonedo (*Mon-do-nethō*).
g, before a, o, u, l, r = g in *go;* but *g* before e, i, is, like our *h*, very strongly aspirated, as Genil (*Henil*); in the syllables *gue, gui*, the *g* is hard, though the *u* is silent.
h, initial is silent: as Hinares (*Inares*); but when followed by *ue*, it has a very slight and somewhat nasal sound.
j and *x*, strong guttural sounds = *ch* in the Scotch and German, or χ in Greek: as Xucar or Jucar, pronounced *Hucar*, with the *h* very strong.
ll = *ll* in French, *gl* in Italian, or *lli* in English *brilliant:* thus Llobregat, Llerena.
ñ = Italian *gn*, French *gne*, or English *ni* in Spaniard: as Coruña (*Cor-un'-ya*).
que, qui = English *kee:* as in Guadal*qui*vir (*Gua-dal-ki-vir'*).
r initial, and *rr* in the middle of words have a strong rolling sound, as in Ronda, Zadorra.
s = English *s* in chase; never like English *z*.
th = English *t:* as Thomar (*To'mar*).
z, as *th* in thin: thus, Zaragoza (*Tha-ra-go'tha*).
Vowels: *a* = *a* in father, never like *a* in make; *i* and *y* = *ee*, or *i* in machine; *u* = Italian *u*, or English *u* in rule; *au* like *ou* in our; *ay* and *aí* = *i* in pine; as Dalmiel, also spelled Daymiel (*Di'miel*); *ou* = *ow* in now.

de la Frontera 13 (Guadairo), Carmona 15, Marchena 13 (Carbones), Osuna 17 n. (Madre Vieja), Ecija 24 (Genil or Xenil).

Lebrija, Constantina, Cazalla, Alcala, Fuentes-de-la-Campana, Estepa.

Cordova.—CORDOVA 42, Montoro 11 (Guadalquivir), Montilla 13 n., Cabra 12, Lucena 17 n. (Cabra), Baena 13 n. (Guadajos), Priego 14 (Salado, *affl.* Genil).

Palma, Bujalance, Rambla, Villanueva, Hinojosa, Pozoblanco, Castro del Real, Espeja, Fernan Nuñez, Puente-Genil.

Jaen.—JAEN 23 (Jaen, *affl.* Guadalquivir), Baeza 11, Andujar 10, Ubeda 14 (Guadalquivir), Alcala la Real 12 (Guadajos), Martos 11 (Salado).

Cazorla, Linares, Alcandete, Torre Don-Gimeno, Porcunna.

Huelva.—HUELVA 7 (Odiel).

Valverde, Moguer, Palos, Ayamonte.

Cadiz.—CADIZ 72, San Fernando 10 (Isle of Leon), San Lucar 16 (Guadalquivir), Puerto S. Maria 18, Xeres de la Frontera 39, Arcos 11 (Gaudalete), Chiclana 21, Medina-Sidonia 11 (Lerio), Algeciras 11 (Strait of Gibraltar).

Rota, Olvera, Ubrique, Vejer de la Frontera, Alcala de los Gazules, Tarifa, San Roque, Gimena, Grazalema.

Malaga.—MALAGA 95, Antequera 17 (Guadaljorce), Velez Malaga 16 (Velez), Ronda 16 (Guadiaro).

Estepona, Marbella, Archidona, Alora, Alhaurin, Coin, Monda, Colmenar.

Granada.—GRANADA 67, Loja 15 (Genil), Motril 12 (Guadalfeo), Baza 11 n. (Barbata, *affl.* Guadalquivir).

Montefrio, Alhama, Almuñecar, Adra, Huescar, Puebla.

Almeria.—ALMERIA 29 (Almeria), Cueva de Vera 10, Huercalovera 12 (Almanzora), Velez Rubio 12 (Velez), Berja 10 (Adra).

Nijar, Gergal, Dalias, Mojacar, Vera, Seron, Velez Blanco, Oria.

SEVEN EASTERN PROVINCES.

Murcia.—MURCIA 88, Cieza 10 (Segura), Lorca 40 (Sangonera), Caravaca 10, Cehigan 10 (Caravaca), Cartagena 22 (S. coast).

Yecla, Jumilla, Mula, Calasparra, Alhama, Fuente, Alamo, Totana, Almazarron, Bullas, Moratello.

Albacete.—ALBACETE 11 n., Chinchilla 12 n. (Guadarmina, *affl.* Guadalquivir), Hellin 10 (Mundo), Peñas de San Pedro 10 (Madera).

Alcaraz, Bonillo, Almanza, Tarazona, Tobarra, Caudete, Yeste.

Alicante.—ALICANTE 31 (E. coast), Orihuela 18 (Segura), Elche 18 (Elche), Alcoy 27 (Alcoy).

Villajoyosa, Aspe, Novela, Monovar, Villena, Gandia, Concentaina, Crevillente.

Valencia.—VALENCIA 108 (Guadalaviar), Alcira 13 (Jucar), San Felipe de Xativa 13 (Albayda).

Liria, Cullera, Sueca, Ayora, Carcajente, Onteniente, Enguera, Murviedro, Torrente.

Castellon-de-la-Plana. — CASTELLON-DE-LA-PLANA 17 (Mijares), Vinaros 11 (Cenia).

Segorbe, Villa-Real, Alcora, Benicarlo, Burriana, Morella.

Tarragona.—TARRAGONA 13, Reus 28 n., Valls 11 (Francoli), Tortosa 26 (Ebro).

Barcelona.—BARCELONA 190 (Besos), Igualada 10 (Noya), Manresa 13 (Llobrogat), Vich 10 (Ter), Villanueva 10 (Foix), Mataro 13 (coast).
Tarrasa, Villafranca, Cervera.

SIX NORTH-EASTERN PROVINCES.

Gerona.—GERONA 8 (Ter), Olot 12 (Fluvia).
Blanes, S. Feliu de Guixols, Figueras.

Lerida.—LERIDA 17 (Segre).

Huesca.—HUESCA 9 (Isuela), Fraga 5, Barbastro 6 (Cinca).

Zaragoza.—ZARAGOZA 67 (Ebro).
Caspe, Tarazona, Calatayud.

Teruel.—TERUEL 7 (Guadalaviar), Alcañiz 6 (Gaudalope).

Navarra.—PAMPLONA 23 (Agra).
Tudela, Estella, Sanguesa.

TWELVE CENTRAL PROVINCES.

Burgos.—BURGOS 26 (Arlanzon, *affl.* Douro).

Logroño.—LOGROÑO 7, Calahorra 6, Haro 6 (Ebro).

Palencia.—PALENCIA 11 (Carrion, *affl.* Pisuerga).

Valladolid.—VALLADOLID 43 (Pisuerga).
Medina de Rio Seco.

Soria.—SORIA 3 (Douro).

Segovia.—SEGOVIA 13 (Eresma, *affl.* Douro).

Avila.—AVILA 5 (Adaja, *affl.* Douro).

Madrid.—MADRID 298 (Manzanares).
Alcala, Chinchon, Colmenar.

Guadalaxara.—GUADALAXARA 5, Siguenza 5 (Henares).

Cuenca.—CUENCA 6 (Xucar), Requena 11, Utiel 6 (Magro).

Toledo.—TOLEDO 15 (Tagus).
Talavera, Madridejos, Quintanar, Ocaña.

Ciudad Real.—CIUDAD REAL 8 n. (Guadiana), Almagro 13 n., Valdepenas 10 (Jabalon), Daimiel 12 (Azur).
Manzanares, Solana, Almodovar, Alcazar, Herencia, Almaden.

TWO INSULAR PROVINCES.

Baleares.—PALMA 53, Manasor 10, Soller 7 (Majorca), Port-Mahon 13, Ciudadela 8 (Minorca), Iviza 6 (Iviza).

Canaries.—SANTA CRUZ 11, Laguna 7, Orotava 8 (Island Teneriffe), Las Palmas 13 (Grand Canary).

PORTUGAL formerly consisted of six, but latterly of eight provinces (besides the Azores and the Madeira group), and these

are subdivided for administrative purposes into twenty-six *comarcas* or shires.

Minho.*—BRAGA 20 (Ria d'Este).
Viana, Guimaraens, Prado.

Tras-os-Montes.—BRAGANCA 5 (Sabor).

Douro or **Maritime Beira.**—OPORTO 89 (Douro), Coimbra 18 (Mondego), Ovar 10 (Vouga).
Aveiro, Mira, Figuera.

Upper Beira.—VISEU 9 (Vouga), Lamego 9 n. (Douro), Almeida 7 (Coa).

Lower Beira.—CASTELLO BRANCO 6 (Vereza), Covilha 5 (Zezere).

Estremadura.—LISBON 223 (Tagus), Setubal 13 (Sadao).
Abrantes, Torres-Vedras, Cezimbra, Vimeira.

Alemtejo.—EVORA 13 (Xarama), Elvas 11 (Guadiana).
Portalegre, Castello de Vide, Estremoz, Beja, Serpa.

Algarve.—FARO 8, Lagos 7, Loulé 8 n., Tavira 11 (S. co.)

Azores.—ANGRA 12 (Terceira), Ponta Delgada 16 (San Miguel).

Madeiras.—FUNCHAL 18 (Madeira), Porto Santo 6 (Porto Santo).

Descriptive Notes.—Spain, including the islands, contains only four cities of above 100,000 inhabitants—viz., Madrid, Barcelona, Seville, and Valencia; six above 50,000—viz., Malaga, Murcia, Cadiz, Zaragoza, Granada, and Palma; and nineteen between 20,000 and 50,000. The southern provinces (Andalucia and Granada) are by far the most densely peopled portions of the kingdom, and contain a full half of the total number of towns; the twelve central provinces are very thinly peopled, while the western and northwestern are the least populous of all.

San Sebastian, a strongly-fortified seaport-town, and the largest in the province, was taken by storm by the British from the French in 1813, and reduced to ashes; but has since been rebuilt, and is now one of the finest cities in Spain. **Bilbao**, the principal port of the north of Spain, and the great emporium of Spanish wool for exportation. **Vitoria**, celebrated for a great victory gained by the Duke of Wellington over the

* The Portuguese vowels *a, e, i, o, u, y*, and the diphthongs *ai, ay, au, ei*, and *ey*, have essentially the same sound as in Spanish; but *ao* is nasal, as in Macao (*Ma-coung'*), while the combinations *ei* and *oi* are not diphthongs: as Beira, Coimbra (*Be'i-ra, Co-im'bra*).

c has a hard and soft sound as in English, but has the *cedilla* more frequently than in Spanish.

ch and *x* = *ch* in French or *sh* in English: thus, Chaves, Funchal, Xeres (*Shá'ves, Fung'shal, Sha'res*).

g before *e, i*, and *y*, and *j*, have the same sound as in French: as Caldas-do-Geres, Alemtejo (*Caldas-do-Zhe'res, Al-eng-te'zho*).

h is always silent, but when it follows *l* or *n* it renders these letters liquid: thus, Covilha, Minho (*Co-vil'ya, Min'yo*).

m and *n* are frequently nasal, and similar to that of *ao*: as Alemtejo (*Al-eng-te'zho*).

gu and *qu* are sounded like our *g* hard and *k*, the *u* being silent: thus, Guadiana, Ourique (*Ga-di-a'na, Oo-res'kay*).

French in 1813. **Santander** was sacked by the French in 1808: it has productive iron-mines in the vicinity. **Oviedo**, noted for its hot mineral springs and baths. **Coruna**, a flourishing commercial and fortified town, with a fine harbour. It was from this port the Spanish Armada set sail for the conquest of England in 1588; and near this, on the heights of Elvina, the French were defeated by the troops under Sir John Moore, who fell in the hour of victory, January 1809. **Ferrol**, one of the three principal arsenals of Spain, is strongly fortified. **Santiago de Compostella**, with a university, and a magnificent cathedral dedicated to St James the Elder, the patron saint of Spain. **Zamora**, with manufactures of coarse woollen hats, leather, and gunpowder. **Salamanca**, with an ancient and famous university, formerly the principal seat of learning in Spain, but now greatly decayed: here the French were defeated by Wellington in 1812. **Badajos**, a strongly-fortified city on the Guadiana, repeatedly taken and retaken in the Peninsular war, is the birthplace of the painter Murales. **Seville** or **Sevilla**, one of the most ancient towns in Europe, the capital of Spain under the Gothic dynasty, and afterwards of Andalucia, was long the chief residence of the Spanish monarchs; has a fine cathedral, and one of the principal universities of Spain: it has the largest cigar and tobacco manufactory in Europe, employing 3000 persons. **Cordova**, once the capital of the Caliphate of the West, and afterwards of the kingdom of Cordova. In modern times this city was noted for its manufacture of a sort of leather, called *cordwain* or *cordovan*, which has now declined. **Cadiz**, a large fortified city on the Isle of Leon, the principal commercial city in the kingdom, and the centre of the trade in sherry wine. **Xeres de la Frontera**, extensively engaged in the manufacture of wine, and giving its name (*sherry*) to one variety. **Malaga** is the chief port of the province, and largely engaged in exporting wines, raisins, almonds, and other fruits. The Malaga raisins, called muscatels, fetch a greatly higher price than any other description. **Granada**, in a plain renowned for its beauty and fertility, was the capital of the last Moorish kingdom in Spain; the palace of the kings, the famous Alhambra, a noble specimen of Moorish architecture, is still standing. **Murcia**, with government factories of nitre and gunpowder, and a richly-decorated cathedral. **Lorca**, a busy thriving town, with manufactories of saltpetre, linen, and thread. **Cartagena** or **Carthagena**, founded by a Carthaginian colony, on the finest harbour in the Mediterranean, is the chief naval arsenal of Spain. **Valencia**, a large maritime and manufacturing city, with a flourishing university, is largely engaged in the silk manufacture. **Tortosa**, a strongly-fortified city on the Ebro, with an active fishery in sturgeons and lampreys. **Barcelona**, the former capital of Catalonia, and the second city in Spain in point of population, is strongly fortified, has a university and four public libraries, one of which is celebrated as containing many valuable MSS. Barcelona is largely engaged in trade and manufactures, and has for ages been a place of great importance. **Zaragoza** or **Saragossa** (Cæsarea Augusta), an ancient and populous city on the Ebro, and the only place of importance in the north-eastern provinces, was the capital of the old kingdom of Aragon; it contains a university; and its cathedral is celebrated over Spain for its sanctuary, which attracts numerous pilgrims. Memorable for a most heroic defence against the French in 1809. **Pamplona** (Pampelo), one of the principal fortresses of Spain, was taken from the French by the British in 1813. **Burgos**, the former capital of Old Castile, is now chiefly celebrated for its cathedral, reckoned one of the finest in Europe, **Valladolid**, formerly a place of great importance, but now much decayed, contains a celebrated univer-

sity; here Columbus died in 1506. **Segovia**, noted for its magnificent Roman aqueduct of 161 arches, and numerous other remains of its former grandeur. **Madrid**, the capital of Spain, occupies an elevated site in the centre of a barren plain, 2200 feet above the level of the sea, and far from any navigable river. It is subject to great inequalities of temperature, and is reckoned very unhealthy. It is about eight miles in circuit; the modern part of the city is handsome, but the number of convents and other religious houses, with grated windows and without visible doors, gives the streets a sombre aspect. Madrid is the birthplace of Alonzo d'Ercilla, Lopez de Vega, Calderon de la Barca, Nuñez, and the brothers Velasquez. **Toledo** was the capital of Spain under the Goths, at which time it had 200,000 inhabitants, though now it has but 13,000. It has long been famous for the manufacture of sword-blades, and great skill is still shown in tempering them. **Almaden**; near it are valuable quicksilver-mines, the most ancient in the world. **Palma**, a fortified city on the S.W. coast of Majorca, has in its vicinity a huge palace, formerly occupied by the Spanish Inquisition. **Port Mahon**, also a fortified town, capital of Minorca, and the residence of the military governor. **Santa Cruz**, capital of the Canary Islands, in the island Teneriffe, has an export trade in wine. **Las Palmas**, the principal town in the same group, has a population of 13,000.

TOWNS IN PORTUGAL.—Portugal, including the islands, contains only two towns above 50,000 inhabitants—Lisbon and Oporto; one at 20,000—Braga; and eleven between 10,000 and 20,000.

Braga, capital of Minho, a considerable town with manufactures of firearms, jewellery, cutlery, and hats. **Braganca**, which gives title to the present royal family, has manufactures of velvets and other silk fabrics. **Chaves**, a fortified town, with hot saline springs of 129° Fahr. Oporto, or Porto, a large commercial city at the mouth of the Douro; in population and commercial importance it ranks next to Lisbon, which it excels in the amount and variety of its manufactures. It exports immense quantities of *port* wine, and has extensive silk-factories, and some of linen and cotton goods. **Coimbra**, on the Mondego, is the seat of the sole university in the kingdom. Coimbra is one of the rainiest localities in Europe—118 inches of rain fall annually. **Lisbon**, the capital of Portugal, on the right bank of the Tagus near its mouth, has upwards of a quarter of a million inhabitants. It contains many splendid architectural monuments, especially the palaces of the nobility, and the magnificent aqueduct of Alcantara, with thirty-six arches of white marble. The streets, however, are narrow, winding, and dirty. There are few important manufactures, except of jewellery and trinkets; and its commerce, which was once considerable, has greatly declined since the Portuguese colonies became independent. Lisbon was the birthplace of Camoens. **Torres-Vedras**, celebrated in the Peninsular war for the lines of defence constructed by Wellington in 1810 to obstruct the approach of the French. **Vimeira**, where the Duke of Wellington defeated the French in 1808. **Evora**, an ancient city of Roman origin, with manufactures of hardware and leather. **Elvas**, a fortified frontier city on the right bank of the Guadiana, with a college and a Moorish aqueduct. **Faro** exports fresh and dried fruits, wine, cork, sumach, and anchovies. **Angra**, a fortified seaport, and capital of the Azores, with a military college and other educational establishments. **Ponta Delgada** is the principal town in the

Azores with regard to population and commerce. **Funchal**, the capital of the island Madeira, is engaged in the manufacture and exportation of Madeira wine.

Capes.—*In Spain:* Cape Finisterre, in Galicia, the most western point of Spain; Ortegal, in the same province, the most northern point of Spain; Creux, in Catalonia, the most eastern; St Martin, in Valencia; Palos, in Murcia; Gata, in Granada; Europa Point near Gibraltar; Tarifa Point, the most southern point of the continent of Europe; Trafalgar, W. of Andalucia, off which Lord Nelson defeated the combined French and Spanish fleets, in 1805. *In Portugal:* Cape Santa Maria, the southernmost point of Portugal; St Vincent, S.W. of Algarve, off which Sir John Jervis signally defeated the Spanish fleet, in 1797; Espichel and Roca guard the entrance of the Tagus: the latter is the most western point of the continent of Europe.

Islands.—*Spanish:* the Balearic Isles,* E. of Valencia, consisting of Majorca, Minorca, Iviza, Formentera, and Cabrera: Leon, W. of the province Cadiz; Canary Islands,† 60 miles S.W. of Marocco—the principal are Lazarote, Fuerte Ventura, Grand Canary, Teneriffe, Gomera, Palma, and Hiero. *Portuguese:* The Azores,‡ 800 miles W. of Portugal; principal, San Miguel, Terceira, Pico, San Jorge, Santa Maria. The Madeira Isles, § 660 miles S.W. of Portugal, consist of Madeira, Porto Santo, and the Desertas.

Bays and Straits.—Bay of Santander, in Santander; Ria de Betanzos and d'Arosa, W. of Galicia; Bay of Cadiz, Bay and Strait of Gibraltar, Gulf of Almeria, S. of Andalucia; Gulfs of Amposta and Rosas, E. of Catalonia. *In Portugal:* Bahia d'Aveiro, W. of Douro; estuary of the Tagus and Bay of St Ubes, in Estremadura; Bay of Lagos, S. of Algarve.

Surface and Mountains.—The Iberian Peninsula—the most westerly of the three grand peninsulas of Southern Europe—in its general characteristics more closely resembles Africa than it does the rest of Europe. For the most part it consists of a lofty plateau, which, in its interior, attains to an elevation of about 2500 feet, and which is skirted on all sides by a low belt of land separating it from the sur-

* In Spanish, *Baleares;* they form one of the 49 provinces; area, 1758 sq. m., population (1864,) 278,000. The climate is temperate and healthy, the soil fertile; principal products—olives, wine, brandy, fruits, saffron, flax.

† The Canaries are of volcanic origin: many extinct craters are found among the mountains, which attain a great elevation, especially the Peak of Teneriffe, which is 12,182 feet above the level of the sea. The climate is equable, and the tropical heat is moderated by the Atlantic breezes: principal products are wine, oil, grain, sugar-cane, and fruits. Area, 3223 sq. m.; pop. (in 1864), 256,403.

‡ The Azores, or Western Islands—in Portuguese *Açores*—are of volcanic origin, with steep and rugged coasts, abounding with deep ravines and lofty mountains. The peak of Pico is 7613 feet high. Climate temperate and healthy, but subject to violent earthquakes: principal products are wines, all kinds of grain and pulse, oranges, sugar-cane, coffee, and tobacco. Area, 1147 square miles; population in 1864, 251,894.

§ The island of Madeira has a peculiarly genial climate, and it is resorted to by invalids afflicted by pulmonary diseases. Area, 334 sq. m.; pop. (1863), 111,764.

rounding seas. The two loftiest mountain-ranges form, respectively, the southern and northern boundaries of this plateau, while the three intermediate ranges traverse it. Owing to the peculiar *saw-like* appearance of their summits, the different ranges are termed *sierras*. The culminating-point of the entire Hesperian system is Cerro Mulhaçen, in the Sierra Nevada, 11,663 feet, where the line of perpetual congelation is 11,200 feet above the sea, while in the Pyrenees it is only 8856 feet.

The Pyrenees, with the mountains of Asturias, which form their western continuation, extend from Cape Creux in Catalonia to Cape Finisterre in Galicia, and separate the basin of the Garonne, Adour, and Bay of Biscay, from the basins of the Ebro and Douro: highest summits—Mount Maladetta (near the centre of the Pyrenees), 11,168 feet; Sierra Penamarella, in Leon, 10,000 feet.

Mountains of Castile, or central chain, separating the basins of the Douro and Tagus: Sierra Gredos, between Old Castile and Estremadura, 10,552 feet; Sierra d'Estrella, in Beira, 7524 feet.

Mountains of Toledo, extending from Cape Espichel in Portugal to the S.W. of Aragon, and separating the basins of the Tagus and Guadiana: Sierra de Guadalupe, 5115 feet.

Sierra Morena, from Cape St Vincent to Cape St Martin, and separating the basins of the Guadiana and Guadalquivir in the W. from those of the Xucar and Segura in the E.; Mount Aracena, in Seville, 5550 feet; Sierra Monchique, in Algarve, 4080 feet.

Sierra Nevada, from the Rock of Gibraltar to Cape Palos, and between the basin of the Guadalquivir and the Mediterranean: highest summit, Cerro Mulhaçen, in Granada, 11,663 feet, forming the culminating-point of the Peninsula.

River-Basins.—The grand line of water-parting of Europe traverses the Peninsula from S.W. to N.E. Commencing at Tarifa Point, it follows the crest-line of the Sierra Nevada in an easterly direction, then turning northward, it forms a semicircular curve, the concave side of which is towards the Atlantic, and strikes the Pyrenees near the source of the Ebro. It thus divides the Peninsula into two unequal slopes, the larger of which bends towards the Atlantic and the smaller towards the Mediterranean. Hence, of the five principal rivers, no fewer than four (Douro, Tagus, Guadiana, and Guadalquivir) find their way to the Atlantic, while the Ebro alone flows to the Mediterranean. The combined area of the former amounts to 85,000 sq. m., and embraces 25 out of the 55 provincial capitals of Spain and Portugal; while the Ebro drains 25,000 sq. m., and embraces in its basin 6 capitals.

Table of Rivers and Towns.—There are 315 towns in the Peninsula at or above 5000 inhabitants, of which 117 exceed 10,000. These stand on 154 rivers, of which 54 enter the sea, the remaining 100 being their affluents. These 315 towns are given in the following table. The capitals of provinces are distinguished by being printed in SMALL CAPITALS, towns above 10,000 in Roman letters, and the remainder in *Italics*.

Basins inclined to the Atlantic.

Rivers.	*Towns.*
Bidassoa,	*Fuenterrabia.*
Urumea,	San Sebastian.
Orria,	TOLOSA.
Nervion,	BILBAO.
Miera,	SANTANDER.
N. Co.,	*Gijon, Aviles.*
Nalon,	OVIEDO.
Masma,	*Mondonedo.*
W. Co. Galicia,	Ferrol.
Mero,	CORUÑA.
Ulla,	*Padron*, Santiago de Compostella, n.
Lerey,	*Pontevedra.*
Ria-de-Vigo,	*Vigo.*
Minho,	ORENSE, LUGO.
Lima,	*Viana.*
Cavado,	*Prado.*
Ria d'Este,	BRAGA.
Ave,	*Guimaraens.*
Douro,	OPORTO, ZAMORA, *Toro*, SORIA.
Corga,	Lamego.
Sabor,	BRAGANÇA.
Coa, *l*	*Almeida.*
Agueda, *l*	*Ciudad Rodrigo.*
Tormes, *l*	SALAMANCA.
Esla,	Benavente.
Tuerto,	*Astorga.*
Bornesga,	LEON.
Seguillo,	Medina del Rio Seco.
Pisuerga,	VALLADOLID.
Carrion,	PALENCIA.
Arlanzon,	BURGOS.
l	
Adaja, *l*	AVILA.
Eresma,	SEGOVIA.
Vouga,	Ovar, *Aveiro*, VISEU.
Co. of Douro,	*Mira.*
Mondego,	*Figueira*, Coimbra, *Guarda.*
Soura, *l*	*Pombal.*
Sizandro,	*Torres-Vedras.*
Tagus,	LISBON, *Santarem*, *Abrantes Garrobellas*, Talavera de la Reina, TOLEDO, *Ocaña*, n., *Colmenar.*
Zatas, or Ervidal, *l*	*Portalegro.*
Anhatura, *l*	*Estremoa.*
Zezere,	*Covilha.*
Veresa,	CASTELLO-BRANCO.
Figueiro,	*Castello de Vide.*
Sever, *l*	*Valencia de Alcantara.*
Salor, *l*	*Montanches.*
Caceres,	CACERES.
Alagon,	*Alcantara*, *Bejar.*
Jerte, *l*	*Placentia.*
Rio del Monte,	*Trujillo.*

Rivers.	*Towns.*
Tajuna,	*Chinchon.*
Xarama,	MADRID, n.
Manzanares,	MADRID.
Hinares, *l*	*Alcala*, GUADALAXARA.
Co. Estremadura,	*Cezimbra.*
Sadao,	Setubal.
Xamara,	EVORA.
S. Co. Algarve,	Lagos, FARO, Loulé, Tavira.
Guadiana,	*Ayamonte*, *Serpa*, Olivenza, Elvas, BADAJOS, Don Benito, Villanueva de Serena, n., CIUDAD REAL, n.
Odiarca,	*Beja.*
Ardila, *l*	*Xeres de los Caballeros.*
Murtiga, *l*	*Fregenal de la Sierra.*
Gavora,	*Albuquerque.*
Guadajira, *l*	*Villafranca.*
Matachal, *l*	*Llerena.*
Zujar, *l*	Villanueva, *Cabeza del Buey.*
Guadalefra, *l*	*Castuera.*
Guadalmez,	*Almaden*, n.
Guadaramillo,	*Hinojosa*, n., *Pozoblanco.*
Jabalon, *l*	Almagro, n., Val de Peñas, *Santa Cruz de Mudela*, *Villanueva de los Infantes*, n.
Vejer, *l*	*Almodovar.*
Zancara,	*Alcazar de San Juan*, n.
Giguela,	*Herencia*, *Quintanar.*
Amarquilla,	*Madridejos*, *Consuegra.*
Azuer, *l*	Daimiel, *Manzanares*, *Solana.*
Odiel,	HUELVA, *Valverde.*
Tinto,	*Palos*, *Moguer.*
Guadalquivir,	*Lebrija*, S. Lucar de Barameda, SEVILLE, Carmona, n., CORDOVA, *Bujalance*, Montoro, Andujar, Baeza, n., Ubeda.
Salado, *l*	Utrera, n.
Guadaira, *l*	*Alcala*, Moron - de - la-Frontera.
Guesna,	*Constantina*, *Cazalla.*
Carbones, *l*	Carmona, Marchena.
Madre Vieja, *l*	*Campana*, *Fuentes-de-la-Campana*, Osuna, n.
Genil, *l*	Ecija, *Puente - Genil*, *Estepa*, n., Loja, *Montafrio*, n., GRANADA.

Basins inclined to the Atlantic (continued).

Rivers.	*Towns.*
Cabra,	*Rambla*, n., Montilla, n., Cabra, Lucena, n.
Salado,	Priego.
Alhama, *l*	*Alhama.*
Guadiata,	*Villanueva.*
Guadajos, *l*	*Fernan Nuñez*, n., *Espejo*, Castro, Baena, n., Alcala la Real.
Salado, *l*	*Porcunna*, n., *Torre Don-Gimeno*, Martos.
Guadarmina,	*Alcaraz*, ALBACETE, n., Chinchilla, n., *Bonillo.*
Guarrezas,	*Linares.*
Jaen, *l*	JAEN.

Rivers.	*Towns.*
Gaudiana-Minor, *l*	Ubeda.
Barbata,	BAZA, n., *Huescar*, *Puebla.*
Vega, *l*	*Cazorla.*
Guadalete	CADIZ, n., *Rota*, n., Puerto Santa Maria, Xeres de la Frontera, Arcos, *Olvera.*
Majaceite, *l*	*Ubrique.*
Lirio,	San Fernando, n., Chiclana, Medina-Sidonia.
Barbate,	*Vejer.*
Vadalmedina,	*Alcala de los Gazules.*

Basins inclined to the Mediterranean.

Strait of Gibraltar,	*Tarifa*, Algeciras, Gibraltar, *San Roque.*
Guadiaro,	*Gimena*, *Grazalema*, n., Ronda.
S. Co. Malaga,	*Estepona*, *Marbella.*
Guadaljorce,	MALAGA, n, *Alora*, Antequera, *Archidona.*
Faala,	*Alhaurin*, *Coin*, *Monda.*
Velez,	Velez Malaga, *Colmenar.*
S. Co. Granada,	*Almuñecar.*
Guadalfeo,	Motril.
Adra,	*Adra*, *Dalias*, Berja.
Almeria,	ALMERIA, *Nijar*, n., *Gergal*, n.
Almanzora,	Vera, Cueva de Vera, *Seron*, Huercalovera.
S. Co. Murcia,	*Almazarron*, Cartagena.
Segura,	Orihuela, MURCIA, Cieza, *Calasparra*, *Yeste.*
Elche, *l*	Elche, *Crevillente*, *Aspe*, *Novelda*, *Monovar*, *Villena*, *Yecla*, n., *Caudete.*
Alfera,	*Almanza.*
Sangonera,	MURCIA, *Mula*, n., *Alhama*, n., *Fuente*, *Alamo*, *Totana*, Lorca, *Velez Blanco.*
Quiper,	*Bullas.*
Velez,	Velez Rubio, *Oria*, n.
Caravaca,	Caravaca, Cehigan.
Moratalla,	*Moratalla.*
Mundo, *l*	Hellin, *Jumilla*, n., *Tobarra.*
Madera, *l*	Penas de San Pedro, n.
E. Co. Alicante	ALICANTE, *Villajoyosa.*
Alcoy,	*Gandia*, *Concentaina*, Alcoy.
Xucar,	*Cullera*, *Sueca*, Alcira, *Ayora*, n., CUENÇA.

Magro, *l*	Requena, *Utiel.*
Albayda,	Xativa San Felipe, *Carcagente*, Onteniente.
Canoles, *l*	*Enguera.*
Jara, *l*	*Tarazona.*
Guadalaviar,	VALENCIA, TERUEL.
Palancia,	*Murviedro*, *Segorbe.*
Rio Seco,	*Burriana.*
Mijares,	CASTELLON-DE-LA-PLANA *Alcora*, n.
Co. Castellon-de-la-Plana,	*Benicarlo*, Vinaros.
Ebro,	Tortosa, *Caspe*, ZARAGOZA, *Tudela*, *Calahora*, LOGROÑO, *Haro.*
Segre, *l*	LERIDA.
Cinca,	*Fraga*, *Barbastro.*
Isuela,	HUESCA.
Balira,	ANDORRA (capital of Republic).
Guadalope,	*Alcaniz.*
Bergantes,	*Morella*, n.
Jalon,	*Calatayud.*
Queilas,	*Tarazona.*
Alhama,	*Corella.*
Aragon, *l*	*Sanguesa.*
Agra,	PAMPLONA.
Ega, *l*	*Estella.*
Zadorra, *l*	VITORIA.
Francoli,	TARRAGONA, Reus, Valls.
Foix,	Villa-Nueva, *Villafranca.*
Llobregat,	*Tarrasa*, Manresa.
Noya,	Igualada, *Cervera*, n.
Besos,	BARCELONA.
Co. of Catalonia,	Mataro, *Blanes*, *S. Feliu de Guixols.*
Ter,	GERONA, Vich.
Fluvia,	Olot.
Manol,	*Figueras.*

Lakes.—There are no lakes of any importance in either Spain or Portugal. There is, however, a large salt-water lagoon on the coast of Valencia, abounding in fish and wild-fowl, called Albufera de Valencia; and three small lakes in Ciudad-Real, near the sources of the Guadiana.

The first, which forms its source, is called Lake Real; then the river traverses some miles of its course under ground, and reappears in two small lakes called Los Ojos de Guadiana, or "the Eyes of the Guadiana."

Climate.—The Peninsula being so extensive, and there being a great difference of elevation between the interior and the maritime districts, great differences of climate exist. On the great central plateau, which has an average elevation of 2500 feet, great heat and drought prevail in summer, and severe cold in winter. The mean annual isotherm of 60° passes E. and W. through the centre of the Peninsula. At Madrid, in the centre of the Peninsula, the mean annual temperature is 58°.2, the mean summer, 76°.4, and the mean winter, 43°.1. Here winter is the rainy season, when frosts are severe at night, the thermometer often sinking below 40°; while in summer it not unfrequently rises to 90°, and the total amount of annual rain does not exceed 10 inches. The most noxious winds are the *Solano*, a hot wind from the S., and the *Gallego*, a cold, piercing wind from the N.W. In the N.W., the climate is damp, the annual precipitation varying from 25 to 35 inches; but at Bilbao, it is said to exceed 100 inches. In the western provinces it is mild, but variable; in the S.W., almost African; and in the S.E. an almost perpetual spring prevails. The climate of PORTUGAL is generally healthy, especially in the elevated regions. Mean annual temperature at Lisbon, 61°.3; winter, 52°.4; and summer, 70°.9. Rain is very abundant on the west coast, especially in autumn, the tract extending from Coimbra to Mafra being the rainiest spot on the continent of Europe. Here 118 inches of rain fall annually. Snow is rare in the southern provinces of the kingdom.

Geology.—The western half of the Peninsula, from the Bay of Biscay to the Gaudalquivir, consists for the most part of Silurian strata, interspersed with extensive tracts of granite, especially in the north; another belt of Silurian rocks lines the coast from Gibraltar to Cartagena; and a third is found around Calatyud, between the sources of the Tagus and Douro. Upper Palæozoic beds prevail in the Pyrenees, and in a large tract S. and W. of Oviedo, between the sources of the Minho and Ebro. Secondary beds prevail along the north coast from Cape Peñas to St Sebastian; another broad tract extends in a S.E. direction from Burgos to Castellon-de-la-Plana; a similar belt along the heights which divide the waters of the Gaudalquivir from those flowing to the Mediterranean; and a fourth along the Atlantic, from Lisbon to near Ovar. Almost the entire remainder of Spain consists of tertiary formations, little of which is found in Portugal, except along the south bank of the Tagus from its mouth to Alcantara.

Minerals.—The mineral treasures of Spain are remarkable both for their variety and abundance, there being scarcely any important mineral substance that is not found in one or more localities. The principal mines presently wrought, however, are in the Pyrenees and their western continuation, and in the Sierra Morena. In the Pyrenees are found immense deposits of iron, copper, and lead; in the

Cantabrian Mountains, and recently in Majorca, valuable deposits of coal; tin, zinc, antimony, and arsenic, in many localities; silver near Guadalcanal, in Seville; rock-salt in Cordova; precious stones in many places; jasper, granite, alabaster, and beautifully variegated marble almost everywhere; while the quicksilver-mines of Almaden have been long celebrated. These precious "treasures of the low-lying deep," however, are sadly neglected; for in Spain all things are in a state of utter stagnation. The minerals of Portugal are almost as varied and valuable as those of Spain, and almost equally neglected. The principal mineral products that are in some measure wrought are iron, marble, and salt (from lagoons). Iron is very abundant; a small gold-mine is wrought at Setubal; there are only two coal-mines, one at Oporto and the other at Buarcos; tin, lead, and antimony are now wholly neglected.

Botany.—The indigenous vegetation of Spain and Portugal belongs exclusively to Schouw's third "Phyto-Geographical Region," described under "Europe" (p. 81). The number of indigenous plants in the whole Peninsula has not been ascertained; but Reuter collected 1250 species of flowering-plants in New Castile alone. According to Webb and Berthelot, 900 species of flowering-plants are found in the Canary Islands. The best building-timber grows on the north coast; the cork-tree, the Kermes oak, and the Sumach tree, farther south. Of food-plants, the vine, olive, orange, fig, citron, date, abound on the E. coast, together with carobs, or St John's bread, sweet potato, the sugar-cane, and the cotton-plant, along with pomegranates, figs, almonds, olives, in the S.; nuts, gooseberries, and orchard-fruits in the N. and N.W. In Portugal are found the vine, date, olive, orange, lemon, citron, the American aloe, rice, stone-pine, orchard-fruits, and water-melons.

Agriculture is in a very backward state in all parts of the Peninsula, though it forms the leading occupation of the people of both countries. The implements of husbandry are of the rudest description; the rotation of crops, and indeed all the modern improvements, are wholly unknown. Though the soil in many parts is extremely fertile, especially in Portugal and the south of Spain, only about a half of the surface is under cultivation. The principal objects of culture are grain crops of all kinds (including wheat, barley, maize, and rice); the vine, cotton, tobacco, mulberry-plant, sugar-cane, hemp, and flax. The corn-crop is generally sufficient for home consumption, and large quantities of wine and fruits are exported, those of Xeres (sherry), Malaga, and Oporto (port wine), being the most celebrated. The central plateau, especially in Castile and Leon, consists of pasture-ground, where vast numbers of merino sheep are reared for the sake of their valuable wool.

Zoology.—Of the 223 mammalia inhabiting Europe, 69 are found in the zoological province to which Spain belongs—a province conterminous with the phyto-geographical region above mentioned. Of the 490 European birds, 294 are found here; and of the 73 reptiles, 51 species. Of the 69 mammals, 42 species are carnivora, 16 rodents, and 9 ruminants; while of the two remaining, one is a quadrumanous animal—viz., the Barbary ape, which inhabits the rock of Gibraltar,

the only locality in Europe where quadrumana are found; and the other a pachyderm—viz., the *Sus scropha*, or wild-boar. The wolf, bear, chamois, and ibex, are found in the Pyrenees; the marten in Biscay; the chameleon near Cadiz; lynxes, foxes, wild-cats, and weasels, in numerous localities. The buffalo is the only bovine species, but there are three species of sheep, one of which (the merino) yields a great quantity of the finest wool, and is forbidden to be exported. This breed, however, is now largely reared in Saxony and other German States. Of the numerous birds, we can only mention the eagle, vulture and flamingo. Fish is not plentiful in the rivers, but abundant on the Atlantic coasts.

Ethnography.—The people of the Peninsula nearly all belong to the Greco-Latin variety of the great Caucasian race; but overrun as the country has been at different times by widely-different tribes, a considerable variety of race appears in the different provinces. The Iberians, and afterwards the Celts, were the earliest inhabitants, and Celtic blood still predominates both in Spain and Portugal. The south of Spain was colonised by the Phenicians and Carthaginians in the fourth century before our era; the Romans subdued the whole Peninsula, B.C. 206; the Vandals, Suevi, and afterwards the Visigoths, overran the country in the beginning of the fifth century; the Moors, or Saracens, drove the Goths to the northern mountains in A.D. 714, and for seven centuries thereafter retained possession of the centre and south, where they established several powerful kingdoms, but were finally expelled in 1492 by the Christians, under Ferdinand and Isabella. Notwithstanding this great intermixture of blood, four distinct families are still discernible—viz., the Spaniards proper, descended from the Celts, Phenicians, Romans, and Goths, constituting about nineteen-twentieths of the entire population; the Basques, in the north-west provinces, the descendants of the ancient Iberians; the Moors, in the south; and the Gypsies or Gitanos, probably of Hindu origin, numbering about 50,000, in various localities. The Jewish race was totally expelled in 1492.

Languages.—Notwithstanding the great extent of the Peninsula, the languages and dialects are comparatively few; and, with the exception of the *Basque*, whose relations are yet unknown, belong to the Greco-Latin family. The Spanish and Portuguese, both of them descendants of the ancient Galician, and for a long time mere dialects of the same language, have at length come to differ considerably. The *Spanish proper*, or *Castilian*, found in its greatest purity in Castile, is manifestly descended from the Latin, though with a considerable admixture of Gothic, and more especially of Arabic words. So conspicuous is the latter element, that some philologists reckon it as a sort of connecting-link between the Indo-European and Semitic stocks. In grammatical structure, however (the main element to be considered in determining the affinities of a language), as also in the great bulk of its roots, it bears little resemblance to the Arabic or any other Semitic tongue. In addition to the Peninsula, Spanish is spoken in Spanish America, the Philippine Islands, and other eastern posses-

sions of Spain. The *Catalan*, or *Catalonian*, a mere dialect of the Spanish, is spoken in the old provinces Catalonia and Valencia, and in the Balearic Isles. The *Portuguese* is spoken in Portugal, Madeira, the Azores, and Brazil. It is a twin sister of the Spanish, both being descended from the Latin, through the Galician; but it now exhibits so many peculiarities that the difference between the two languages is something more than dialectic. The Portuguese is less guttural, but harsher and more unpleasing in sound than the Spanish, and possesses a class of words which cannot be traced in the Spanish vocabulary, and which are supposed to have proceeded from dialects of the Berber language, which prevails in the north of Africa.

Religion and Education.—The Roman Catholic has for ages been almost the sole religion in either Spain or Portugal, though in the latter country a very limited amount of toleration has been enjoyed by the Jews and some Protestant denominations. In both countries, however, great changes have recently taken place in ecclesiastical affairs; and since the flight of Queen Isabella, in 1868, toleration has been freely accorded in Spain to all denominations. In both countries education is still in a lamentably deficient state, notwithstanding the marked progress which has recently taken place. In 1861 there were in Spain 58 public colleges for middle-class education, with 757 professors and 13,881 students, besides 22,060 common schools, attended by 1,046,558 pupils, being one-fifteenth part of the population. In Portugal education is entirely free from the control of the Church, and yet, with the exception of Russia and the Papal States, Portugal is the worst educated country in Europe, there being, in the year 1862, only 1 in every 36 persons able to read and write. The sole university is that of Coimbra, while in Spain there are no fewer than ten—the chief of which are those of Salamanca, Valencia, Zaragoza, and Valladolid.

Literature.—The most distinguished names in Spanish literature are the following:—POETRY: The author of "The Cid," who has been called "The Homer of Spain:" this, the oldest poem in the Spanish language, describes the adventures of *El Seid*, "the Lord" (a famous Castilian hero, born at Burgos in 1040), and was written about the middle of the twelfth century; Herrera, Ercilla, Lope de Vega, Calderon de la Barca, Garcilasso, Gomez de Quevedo. HISTORY: Mariana, author of 'The History of Spain;' Antonio de Solis, the historian of 'The Conquest of Mexico.' FINE ARTS: Ribera, Murillo, Morales, Fernandez, Ribalta, Velasquez, Henrique Marinas, Juan de Alfaro. FICTION: Cervantes, author of 'Don Quixote.' SACRED LITERATURE: Cardinal Ximenes, Isidore of Seville, Michael Servetus. MARITIME TRAVEL: Columbus (a Genoese), Pinzon, Ponce de Leon, Fernandez Cortez, Pizarro, Velasquez, Cordoba. The classic poets Lucan and Martial, and Seneca the philosopher, were natives of Spain, and probably Quintilian. Portugal can boast of few names that have won for themselves a European reputation. The most distinguished name in its literature is Camoens, author of 'The Lusiad;' next to Camoens may be placed

Gil Vicente and Saa de Miranda, the dramatists; Antonio Ferreyra, who has been called the Portuguese Horace; Rodriguez Lobo; and Joãs de Barros, an elegant prose writer. The names of Vasco de Gama, Magellan, Balbao, Cabral, and De Solis, are all celebrated in Portuguese maritime discovery.

National Character.—The Spaniards are grave, stately, and formal in their manners; frugal and temperate in diet; extremely indolent in disposition; of an enthusiastic temperament, which sometimes prompts them to acts of chivalry, but more frequently to the perpetration of revolting atrocities, especially when goaded on by the love of gain or by religious bigotry; in proof of which we need only refer to their inhuman treatment of the natives of America when that continent was discovered, and to the annals of the Inquisition, an infamous institution, which was first established at Seville in 1481, at the instance of Ferdinand, the husband of Isabella, and which reigned in all its terrors down to the present century. "The Spanish statistics of this infernal engine," says Milner, "which was only abolished in 1820, include 34,611 persons burned alive, 18,000 burned in effigy, and 288,109 consigned to the prisons and galleys." The Portuguese are represented as dignified, polite, and temperate, but excessively filthy, both in their houses and persons: they are further characterised by an inveterate dislike to Spaniards, whom, notwithstanding, they greatly resemble in manners and disposition. They are equally bigoted, cruel, and indolent; equally proud and revengeful; and equally fond of the barbarous amusement of bull-fighting; and whatever difference there may be is in favour of the Spaniards, there being no country in Europe where civilisation and morality are at a lower ebb than in Portugal.

Government and Finance.—The Government of Spain, after three and a half centuries of despotism, became, in 1845, a constitutional monarchy, under Queen Isabella II., who was aided in the government by the Cortes, composed of two co-operating bodies—viz., a Senate (the members of which were partly hereditary and partly nominated for life by the sovereign), and a Congress of Deputies elected by the people in the proportion of one deputy for every 35,000 inhabitants. After many years of misrule this last Bourbon sovereign in Europe was compelled in 1868 to take refuge in a foreign land; since then the country has been ruled by a Provisional Government. The army is formed on the French model. Its total strength in 1870 consisted of 80,000 men and officers. In the same year the navy consisted of 6 ironclad frigates, 1 ship of the line, and other 89 steam-ships (useless in modern warfare), carrying 1055 guns, and manned by 22,000 marines. In 1869 the revenue of Spain amounted to £25,846,747, the expenditure to about an equal sum, and the public debt to £213,666,568. The Government of Portugal is a constitutional monarchy, reigning sovereign, Luis I., who succeeded his brother Don Pedro V. in 1861, of the Braganza-Coburg line. The Parliament or Cortes consists, as in Spain, of two chambers—a House of Peers nominated by the sovereign, and the House of Deputies elected by the people. In 1866 the army at home and abroad amounted to about 36,000 men and officers, and the navy to 34 ships of war, carrying 294 guns, and manned by 2832 marines.

In 1867-8 the revenue amounted to £3,752,000; expenditure, £5,044,662; public debt, £47,333,000.

Commerce.—Though few countries in Europe possess greater commercial facilities, on account of the great extent of seaboard, yet such is the natural indolence of the Spaniards that their commerce is quite inconsiderable; and the little that exists can be estimated with difficulty, owing to the universal practice of smuggling. In 1866 the total value of the *Exports* was estimated at £12,000,000, and the *Imports* at £20,000,000. The principal exports consisted of wine, wool, brandy, oil, fruits, iron, lead, mercury, salt, barilla, skins, cork, Spanish flies, liquorice, and dye-stuffs, which were, for the most part, sent to Great Britain and France. The countries from which Spain receives most are France and the United Kingdom. From the latter she received in 1867 to the value of £2,299,000, while in the same year Spain sent to Britain to the value of £6,088,000, one-third of which consisted of wine. The chief seats of the wine manufacture are—Xeres (hence our *sherry*), Rota, near Cadiz, Montilla, Malaga, and Alicante, the last two of which are also famed for raisins. The province Valencia is especially famous for its great variety of wines, large quantities of the variety known as Benicarlo being exported to Bordeaux, where they are mixed with the wines of the Gironde to impart to them colour and flavour. Spain is the second silk-producing country in Europe (Italy being the first), and her best customer in this article is France. The articles imported from Britain are linen-yarn and linens, iron—both wrought and unwrought—and coal. Manufactures consist chiefly of swords at Toledo, cigars at Seville, leather at Cordova, cotton and silk stuffs in Catalonia, iron in the Basque provinces, and of gunpowder, cannon, porcelain, and glass. The commercial marine in 1864 amounted to 10,487 vessels, carrying 440,000 tons. The principal ports are Barcelona, Cadiz, Malaga, Bilbao, Alicante, and Valencia. Since the loss of her colonial possessions, the commerce of Portugal has vastly decreased. Such commerce as exists is chiefly with England. Wine is pre-eminently the product of Portugal, and constitutes more than two-thirds of all her exports, which, in 1866, amounted to £4,800,000. In the same year her imports amounted to £6,600,000. Besides wine, the chief exports are fruits of the finest quality, salt, cattle, wool, cork, olive-oil, iron and copper pyrites, and elephants' teeth. In 1866 England imported of the red wines of Portugal 3,573,744 gallons. Next to England, Brazil, Russia, and the north of Europe are the principal consumers of port wine. The vine disease, which broke out in 1853, has continued more or less ever since, and has greatly diminished the quantity of wine exported. The imports consist chiefly of corn, rice, salted provisions, sugar, and coffee from Brazil; cotton and woollen goods, hardware, &c., from England; hemp, flax, and deals from the Baltic. The principal ports are Lisbon, Oporto, and Setubal.

Inland Communication.—*Railway* communication is progressing rapidly in Spain. The total number of miles open for traffic in 1869

was 3338. In Portugal, railways have been constructed from Lisbon to the Guadiana, by Abrantes and Elvas; another connects Lisbon with Beja; while a third proceeds from the capital to Coimbra and Oporto: total in 1868, 443 miles.

Canals.—The numerous mountain-ranges which traverse the country, and separate the principal river-basins, present insuperable obstacles to the junction of the rivers that flow into the Atlantic with those that discharge their waters into the Mediterranean; but several canals have been constructed along the banks of such rivers as are not navigable. The principal canals are the Imperial Canal, along the right bank of the Ebro; the canals of Castile, Manzanares, Murcia, Albacete, and Guadarama. There are no canals in Portugal, but the rivers of that country are more navigable than those of Spain.

Roads.—There are no good public roads in either country, except around Madrid; wheel-carriages are little used—the principal part of the transit trade being effected on the backs of mules.

Foreign Possessions.—Of the once magnificent colonies of Spain and Portugal the following are all that remain:—

Spanish.—Ceuta, Tetuan, &c., on the N. coast of Marocco; Fernando Po and Annabona, in the G. of Guinea; Cuba, Porto Rico, and Isle of Pines, in the W. Indies; part of the Philippine and Ladrone Islands, and nominally the Pelew and Caroline Isles, in Oceania. Total area, 87,930 sq. m., and population (in 1864), 6,333,887.

Portuguese.—Besides the Azores and Madeira (for which see page 183), to Portugal belong the Cape Verde Islands, portions of Senegambia, Angola, Benguelo, and St Thomas and Prince's Islands, on the W. coast of Africa, together with Sofala and Mozambique on the E. coast; Goa, Salsette, Diu, and Damaun, in Hindostan; Macao, in China; parts of Timor and Solor, in Malaysia. Total area, 556,362 sq. m.; pop. (in 1865), 10,881,022.

FRANCE.

Boundaries.—France, one of the largest and most important countries of Western Europe, is bounded on its six sides as follows:—N.W., the English Channel, separating it from Great Britain; W., the Atlantic; S.W., the Pyrenees, separating it from Spain; S.E., the Mediterranean; E., Italy, Switzerland, and Baden, from which it is separated by the Alps, Mount Jura, and the Rhine; N.E., Bavaria, Rhenish Prussia, and Belgium. Lat. 42° 20′—51° 6′ N.; lon. 4° 49′ W.—8° 15′ E.

Chateauroux, capital of Indre, near the centre of the empire (lat. 46° 50′, lon. 1° 41′ E), is nearly on the same parallel as Berne, Grätz, Odessa, Astrakhan, Lake Balkash, the N. extremity of Japan, mouth of the Oregon, the S. shore of

Lake Superior, and Quebec; and nearly on the same meridian as Yarmouth, Calais, Barcelona, Algiers, and the capital of Dahomey. The form of the country is hexagonal and very compact; greatest length from the W. coast of Finistère to Nice on the Italian frontier, nearly 700 miles; extreme breadth, from Givet in Ardennes to the mouth of the Bidassao, 585 miles; coast generally low, but bold and irregular in the north-west, with an extreme length, including the larger sinuosities, of 1500 miles. This is a small extent of seaboard for so large a country, but the numerous navigable rivers, and the canals connecting them, make ample compensation for the deficiency.

Area and Population. — Including Corsica, the area is 209,426 sq. miles, or 134,000,000 acres, being 3½ acres to each inhabitant. This is 1⅔ times the size of the British Isles; and France without Corsica is 2½ times the size of Great Britain. At 31st Dec. 1866 the population of France, including Corsica, was 38,192,064, being 182 persons per sq. mile; in 1784 it amounted to 24,800,000. Thus, while the population of the British Isles has more than doubled itself since the French Revolution, that of France has only increased 54 per cent, and has required above a century and a half to double itself. This remarkable fact is mainly owing to war, political proscription, bad harvests, the grape-blight, disease of the silk-worm, and other causes; indeed, every natural or political calamity checks the increase of population in France in a marked degree. The rural population is constantly decreasing, and that of the large towns increasing. The north of France is more populous than the south, and contains a greater number of large towns. The most densely peopled department is that which contains the capital—having 11,753 inhabitants to the square mile; and the least populous is Basses Alpes, which has only 53.

Political Divisions.—France was formerly divided into 34 provinces; but in 1789, when the love of change became paramount, the provinces were divided into 85 departments, or 86 including Corsica; and these were subdivided into 363 arrondissements, 2847 cantons, and 36,819 communes or parishes. The number of departments is now increased to 89 by the reunion to France of Savoie, Haute Savoie, and Nice, after the Italian war of 1859. Though the provinces are no longer recognised in legal documents, they are still familiar among the French people, and they are so frequently referred to in history that we think it necessary to append, at the foot, the following table (arranged in aphabetical order), showing their former capitals, and the departments which now correspond to them.* The

* Old Provinces of France.

Old Provinces.	Old Capitals.	Corresponding Departments.
Alsace	Strasbourg	Haut Rhin, Bas Rhin.
Angoumois	Angoulême	Charente.
Anjou	Angers	Maine-et-Loire.
Artois	Arras	E. part of Pas-de-Calais.
Aunis	Rochelle	N.W. of Charente Inférieure.

departments are named after the most important physical features which respectively characterise them—as the existence of a large river, the confluence of two rivers, or proximity to some mountain-chain. The departments are of much more uniform dimensions than the old provinces, or than the counties of Great Britain; their average size being 2400 sq. miles, or something less than Perthshire. But the department Gironde is larger than the largest of our Scottish counties (Inverness); while that of Seine, which contains the capital, and which is the smallest department in France, is larger than Rutland, the smallest county in England. As the departments are so numerous, they must be arranged in a simple and methodical manner; and this is best done by dividing them into six frontier groups, corresponding with the six sides of the kingdom, together with a larger central group. Then the 88 Continental departments can be easily remembered as follows:—14 north-western, 10 western, 14 southern, 7 south-eastern, 12 eastern, 10 north-eastern, and 21

Old Provinces.	Old Capitals.	Corresponding Departments.
Auvergne	Clermont	Puy-de-Dôme, Cantal.
Avignon	Avignon	W. of Vaucluse.
Béarn	Pau	Basses Pyrénées.
Berry	Bourges	Cher, Indre.
Bourbonnais	Moulins	Allier.
Bourgogne	Dijon	Ain, Côte-d'Or, Saône-et-Loire, Yonne.
Bretagne	Rennes	Côtes-du-Nord, Finistère, Ille-et-Vilaine, Loire Inférieure, Morbihan.
Champagne	Troyes	Ardennes, Aube, Marne, Haute Marne.
Dauphiné	Grenoble	Hautes Alpes, Drôme, Isère.
Flandre	Lille	Nord.
Foix	Foix	Ariège.
Franche Comté	Besançon	Doubs, Jura, Haute Saône.
Gascogne, Guyenne	Auch, Bordeaux	Aveyron, Dordogne, Gers, Gironde, Lot, Lot-et-Garonne, Landes, Hautes Pyrénées, Tarn-et-Garonne.
Ile de France	Paris	Oise, Seine, Seine-et-Oise, Seine-et-Marne, S. of Aisne.
Languedoc	Toulouse	Ardèche, Aude, Gard, Hérault, Haute Garonne, Haute Loire, Lozère, Tarn.
Limousin	Limoges	Corrèze, S. of Haute Vienne.
Lorraine	Nancy	Meurthe, Meuse, Moselle, Vosges.
Lyonnais	Lyon	Loire, Rhone.
Maine	Le Mans	Mayenne, Sarthe.
Marche	Gueret	Creuse, N. of Haute Vienne.
Nivernais	Nevers	Nièvre.
Normandy	Rouen	Calvados, Eure, Manche, Orne, Seine Inférieure.
Orléanais	Orléans	Eure-et-Loire, Loiret, Loire-et-Cher.
Picardy	Amiens	Somme, E. of Pas-de-Calais, N. of Aisne.
Poitou	Poitiers	Deux Sèvres, Vendée, Vienne.
Provence	Aix	Basses Alpes, Bouches-du-Rhône, Var, E. of Vaucluse.
Roussillon	Perpignan	Pyrénées Orientales.
Saintonge	Saintes	E. of Charente Inférieure.
Touraine	Tours	Indre-et-Loire.

Central departments. In the six frontier groups the departments are taken *two deep* from the sea or other boundary.

Fourteen North-Western Departments.

Nord.*—Lille 155, Wattrelos 12, Roubaix 65 n., Tourcoing 38 n. (Deule), Armentières 12, Halluin 11, Bailleul 10 n. (Lys), Valenciennes 24, Cambrai 22 (Scheldt), St Amand-les-eaux 10, Douay 24 (Scarpe), Maubeuge 10 (Sambre), Dunkerque 33 (Str. of Dover).

Towns between 5000 and 10,000 inhabitants.—Estaire, Merville, Hazebrouck, Condé, Anzin, Solesmes, Le Cateau, Bergues, Gravelines, Commines.

Pas-de-Calais.—Arras 26 (Scarpe), St Omer 22 (Aa), Calais 13, St Pierre 15 (Str. of Dover), Boulogne 40 (English Channel).

Aire, Carvin-Epinoy, Bethune, Agincourt.

Somme.—Amiens 61, Abbeville 20 (Somme), Cressy 2 (Maye).

Oise.—Beauvais 15 (Terrein), Compiègne 12 (Oise).

Noyon, Senlis, Clermont.

Seine Inferieure.—Rouen 101, Le Havre 75, Elbeuf 22 (Seine), Bolbec 10 (Bolbec), Dieppe 20 (Arques), Fecamp 12 (N. coast).

Caudebec-les-Elbeuf, Darnetal, Yvetot, St Valery-en-Caux, Sotteville.

Eure.—Evreux 12 (Iton), Louviers 11 (Eure).

Andeleys, Vernon, Pont-Audemer, Bernay.

Eure-et-Loir.—Chartres 20 (Eure).

Dreux, Nogent-le-Rotrou, Chateaudun.

Calvados.—Caen 42 (Orne), Lisieux 13 (Touques).

Falaise, Bayeux, Vire, Honfleur.

Orne.—Alençon 16 (Sarthe), Flers 10 (Vere).

L'Aigle, Argentan, Seez, La Ferte Macé.

Manche.—St Lo 10 (Vire), Cherbourg 37 (Divette), Granville 17 (W. coast).

Valognes, Coutances, Avranches.

Mayenne.—Laval 27, Mayenne 10 (Mayenne).

Chateau-Gontier, Ernée.

* Instead of giving the pronunciation of the different French words as they occur, it seems preferable to advance a few general rules:—

a has two sounds, as in mam-ma; *ai*, *ei* = *è* grave, or *e* in there; *au* = *ō*.

e when unaccented is silent; *é* with the *acute accent*, like the shut sound of *e* in English, as in *bed:* it has the same sound when followed by a silent *r* or *z* at the end of a word; *è*, with the *grave accent*, and *ê circumflex* = *e* in *there*.

eu, the same as *ō* in German, or *ao* in the Irish and Scottish Gaelic: as Eure, Evreux. *eau* and *eaux* = long *ō* in English, as Chateau, Bordeaux (*Sha-tō'*, *Bor'dō*).

ou = *oo* in mood, or *u* in rule; as Angoulême (*An-goo-laim'*).

ç with a *cedilla*, used only before *a*, *o*, *u*, = *s* in English: as Maçon (*Mas-song'*).

ch = English *sh:* as Rochelle, Chartres (*Ro-shel'*, *Shar'tr*).

g before *e*, *i*, and *y*, and *j* = *s* or *z* in *treasure*—thus Ariège, Jura (*Ar-ri-aizh'*, *Zhu'ra*).

gn = *n* or *ni* in Spaniard: as Avignon, Boulogne (*Av-in'yong*, *Boo-loing'*).

d, *s*, *t*, *x*, *z*, are silent at the end of words: as Nord, Nîmes, Lot, Bordeaux, Rhodez (*Nōr*, *Neem*, *Lō*, *Bordō*, *Rhodō*).

an, *en*, *in*, *on*, have no representative in English, and must be acquired from the teacher: they are strictly nasal sounds, faintly resembling *ang*, *eng*, *ing*, and *ong* in English.

u = Fr. *u* in *plus*, *bruler;* it approximates to Scotch *u* in *gude*, *schule;* but has no corresponding sound in English. *ui* and *uy* = English *we*, as Puy-de-Dôme (*Pwee-de-Dōme*).

Ille-et-Vilaine.—RENNES 49 (Vilaine), St Servan 13 (Rance).
Fougéres, Cancale, Redon, Vitre, Fougeray, Combourg, St Malo.
Côtes-du-Nord.—ST BRIEUC 15 (Gouet).
Dinan, Guingamp, Plouha, Lannion, Plouaret.
Finistère.—QUIMPER 11 (Odet), Morlaix 14 (Relec), Brest 80 (Elorn).
Plougastel, Landerneau, Lambezellec, Crozon, Quimperlé.

TEN WESTERN DEPARTMENTS.

Morbihan.—VANNES 15 (G. of Morbihan), L'Orient 38 (Blavet).
Pontivy, Baud, Sarzeau, Ploermel, Plocmeur.
Loire Inférieure.—NANTES 112, St Nazaire 11 (Loire).
Blain, Montoir, Vertou, Vallet.
Maine-et-Loire.—ANGERS 55 (confluence of Sarthe and Mayenne), Saumur 14 (Loire), Chollet 13 (Maine), Chalonnes 6 (Lagon).
Vendée.—NAPOLÉON-VENDÉE or BOURBON-VENDÉE 8 (Yon).
Sables d'Olonne, Noirmoutier, Fontenay, Luçon.
Deux Sèvres.—NIORT 21 (Sèvre Niortaise), Parthenay 5 (Thone).
Charente Inférieure.—LA ROCHELLE 19 (N. coast), Rochefort 30, Saintes 11 (Charente), St Jean d'Angely 6 (Boutonne).
Charenne.—ANGOULÊME 25, Cognac 8 (Charente).
Gironde.—BORDEAUX 194 (Garonne), Libourne 12 (Dordogne).
Dordogne.—PERIGUEUX 20 (Isle), Bergerac 12 (Dordogne).
Sarlat.
Lot-et-Garonne.—AGEN 17 (Garonne), Villeneuve d'Agen 14 (Lot).
Marmande, Tonneins, Nerac.

FOURTEEN SOUTHERN DEPARTMENTS.

Landes.—MONT-DE-MARSAN 5 (Midouze), Dax 10 (Adour).
Basses Pyrénées.—PAU 25 (Gave de Pau), Bayonne 26 (Adour).
Orthez, Olorn.
Hautes Pyrénées.—TARBES 15, Bagnères 9 (Adour).
Gers.—AUCH 12, Lectoure 9 (Gers), Condom 9 (Bayse).
Haute Garonne.— TOULOUSE 127 (Garonne).
St Gaudens, Revel, Villemur.
Tarn-et-Garonne.—MONTAUBAN 26, Castel-Sarrasin 7 (Garonne), Moissac 10 (Tarn).
Ariège.— FOIX 6, Pamiers 8 (Ariège).
Pyrénées Orientales.—PERPIGNAN 25 (Tet).
Aude.—CARCASSONNE 22, Narbonne 16 (Aude).
Limoux, Castelnaudary.
Tarn.—ALBY 15 (Tarn), Castres 21 (Agout), Mazamet 11 (Arnette).
Rabastens, Gaillac, Lavaur, Graulhet, Puylaurens.
Hérault.—MONTPELLIER 56 (Lez), Béziers 28, Bédarieux 10 (Orbe), Lodeve 12 (Lergue), Cette 24 (coast).
St Pons, Agde, Pezenas, Clermont, Meze, Lunel.
Lozère.—MENDE 6 (Lot).
Gard.—NIMES 60 (Vistre), Beaucaire 10, Alais 20 (Gardon).
St Gilles, Le Pont St Esprit, Uzès, Anduze, Le Vigan.
Ardèche.—PRIVAS 7 (Ouvese), Annonay 16 (Cance).
Tournon, Aubenas.

Seven South-Eastern Departments.

Bouches-du-Rhone.—Marseille 300 (Verne), Arles 26, Tarascon 13 (Rhone), Aix 28 (Arc).
St Remy, Salon, Martigues, Aubany, Auriol, La Ciotat.

Vaucluse.—Avignon 36 (Rhone), Carpentras 11 (Auzon), Orange 10 (Aigues).
L'Isle, Cavaillon, Apt.

Var.—Draguignan 10 (Artuby), Toulon 77, La Seyne 12 (coast), Hières 10 (Gapeau), Brignoles 6 (Calami).

Alpes Maritimes.—Nice 50 (Paglione), Grass 11 (Esteron).
Cannes, Antibes, Mentone.

Basses Alpes.—Digne 7 (Bleone), Manosque 6 (Durance).

Hautes Alpes.—Gap 8 (Lure, *aff.* Durance).

Drome.—Valence 20, Montelimar 12 (Rhone), Romans 11 (Isère), Crest 5 (Drome).

Twelve Eastern Departments.

Haute Savoie.—Annecy 11 (Fieran).

Savoie.—Chambery 19 (Leisse, *aff.* Savière).

Isère.—Grenoble 40 (Isère), Vienne 25 (Rhone), Voiron 10 (Morge.)

Rhone.—Lyon 324 (Rhone), Villefranche 12 (Saône), Tarare 15 (Tardine).

Ain.—Bourg 14 (Reyssouse).

Saône-et-Loire.—Macon 18, Chalons 17, Tournus 6 (Saône), Le Creuzot 24 n., Autun 12 (Arroux).

Jura.—Lons-le-Saulnier 10 (Vaillère), Dole 11 (Doubs).
Arbois, Poligny, Salins, St Claude.

Doubs.—Besançon 47, Montbeliard 6, Pontarlier 5 (Doubs).

Haute Saône.—Vesoul 8 (Drejon), Gray 6 (Saône).

Vosges.—Epinal 12 (Moselle), St Diey 10 (Meurthe).
Mirecourt, Remiremont, Gerardmer.

Haut Rhin.—Colmar 24 (Lauch), Mulhausen 59 (Ill), St Marieaux-Mines 12 (Liepvrette), Guebwiller 11 (Lauch).
Belfort, Thann.

Bas Rhin.—Strasbourg 84 (Rhine), Haguenau 11 (Moder).
Saverne, Bischwiller, Schelestadt.

Ten North-Eastern Departments.

Moselle.—Metz 55 (Moselle and Seille).
Thionville, Sarreguemines.

Meurthe.—Nancy 50 (Moselle), Lunéville 16 (Meurthe).
Pont-à-Mousson, Toul.

Meuse.—Bar-le-Duc 15 (Ornain), Verdun 12, St Mihiel 5 (Meuse).

Haute Marne.—Chaumont 7, St Dizier 8, Langres 10 (Marne).

Marne.—Chalons 17, Vitry 8, Epernay 11 (Marne), Reims 56, (Vêle).

Ardennes.—Mezieres 6, Charleville 10, Sedan 16 (Meuse).
Givet, Rethel.

Aisne.—LAON 10 (Delette), St Quentin 33 (Somme), Soissons 10 (Aisne). Chauny, Chateau-Thierry.

Seine-et-Marne.—MELUN 11, Fontainebleau 12 Montereau 6 (Seine), Meaux 11 (Marne), Provins 8 (Vouzie).

Seine-et-Oise.—VERSAILLES 44, St Germain-en-Laye 16 (Seine). Sèvres, Corbeil, Pontoise, Etampa, St Cloud.

Seine.—PARIS 1825, St Denis 26, Vincennes 14, Boulogne 14, Gentilly 9 (Seine).

TWENTY-ONE CENTRAL DEPARTMENTS.

Sarthe.—LE MANS 45 (Sarthe). Sable, La Flèche, Mamers.

Indre-et-Loire.—TOURS 42 (Loire), Chinon 7 (Vienne).

Loir-et-Cher.—BLOIS 20 (Loire), Vendôme 9 (Loir), Romorantin 7 (Sandre).

Loiret.—ORLEANS 49, Beaugency 5, Gien 7 (Loire), Montargis 9 (Loing).

Yonne.—AUXERRE 15, Sens 11 (Yonne). Villeneuve-le-Roi, Joigny, Tonnerre.

Aube.—TROYES 36 (Seine).

Vienne.—POITIERS 31 (Clain), Chatellerault 14 (Vienne). Montmorillon.

Indre.—CHATEAUROUX 16 (Indre), Issoudun 14 (Theols). Buzançais, La Châtre, Le Blanc.

Cher.—BOURGES 30 (Auron), Vierzon 8, St Amand 8 (Cher).

Nièvre.—NEVERS 21 (Loire). Cosne, La Charité, Clamecy.

Côte-d'Or.—DIJON 39 (Ouche), Beaune 11 (Bouzoire), Auxonne 7 (Saône).

Haute Vienne.—LIMOGES 53 (Vienne). St Junieu, St Leonard, St Yrieix.

Creuse.—GUERET 4, Aubusson 6 (Creuse).

Allier.—MOULINS 18 (Allier), Montluçon 16 (Cher). St Pourçain, Gannat, Cusset.

Corrèze.—TULLE 12, Brives 10 (Corrèze, Ussel 11 (Diege).

Puy-de-Dôme.—CLERMONT-FERRAND 38 n., Issoire 6 (Allier), Riom 11 (Ambene), Thiers 16 (Dore), Ambert 8 (Dore).

Loire.—MONTBRISON 7 n., Roanne 17 (Loire), St Etienne 97 (Furens), Rive-de-Gier 14, St Chamond 12 (Gier).

Lot.—CAHORS 14 (Lot), Gourdon 5 (Ceon), Figeac 8 (Celle).

Cantal.—AURILLAC 11 (Cere), St Flour 5 n. (Trueyn).

Haute Loire.—LE PUY 17 (Loire), Yssingeaux 8, Tence 6 (Lignon).

Aveyron.—RHODEZ 12, Villefranche 10 (Aveyron), Milhau 13 (Tarn), St Afrique 7 (Sorgue).

Corsica.—AJACCIO 14 (W. coast), Bastia 19 (N.E. coast).

Descriptive Notes.—France, including Corsica, contains (by the census of Dec. 1866) eight cities of above 100,000 inhabitants—viz., Paris, Lyon, Marseille, Bordeaux, Lille, Toulouse, Nantes, Rouen; fifteen between 100,000 and 50,000—viz., St Etienne, Strasbourg,

Brest, Toulon, Le Havre, Roubaix, Amiens, Reims, Nîmes, Mulhausen, Montpellier, Metz, Angers, Limoges, Nice; and fifty between 50,000 and 20,000.

NORTH-WEST DEPARTMENTS.—These are by far the most populous, having two cities (Lille, Rouen) above 100,000; four between 100,000 and 50,000 (Brest, Le Havre, Roubaix, Amiens); sixteen between 50,000 and 20,000; and twenty between 20,000 and 10,000. **Lille**, a very strongly fortified city on the Belgian frontier, and Vauban's masterpiece, is one of the chief seats of the cotton, linen, and woollen manufactures. **Roubaix, Tourcoing,** and **Bailleul**, important manufacturing towns. **Valenciennes**, a strongly-fortified manufacturing town, famous for its lace, and the birthplace of Froissart in 1337. **Cambrai**, the see of Archbp. Fénélon, has been long famous for its *cambrics*. **Douay**, noted as the place from which was issued the only English version of the Scriptures received by the Roman Catholic Church. **Dunkerque**, a strongly-fortified seaport, and the most northerly town in France. **Arras, St Omer, Calais,** and **Boulogne**, are all strongly fortified, and engaged in various manufactures; the infamous Robespierre was a native of Arras; and at Boulogne, Napoleon I. assembled his flotilla for the invasion of England in 1804. **Calais** is the nearest city in France to the English shores, and is celebrated in the wars between the two countries; and **Boulogne** is the residence of many English families. **Agincourt**, famous for the great victory obtained by Henry V. over a greatly superior French force in 1415. **Amiens**, the birthplace of Peter the Hermit, Du Cange, and Delambre: here was signed the treaty of peace between Britain and France in 1802. **Abbeville**, an important stronghold fortified by Vauban, with numerous manufactures. **Cressy**, famous for the victory obtained by Edward III. over the French in 1346. **Rouen**, one of the most populous and flourishing cities in the north of France, celebrated for spinning and dyeing woollen and cotton stuffs; has a magnificent Gothic cathedral built by William the Conqueror, and a statue of the celebrated Joan of Arc, who was burnt to death here in 1431. **Le Havre** and **Rouen** are the two great seaports of Paris, with which they are connected by the Seine and by railway. **Elbeuf** is one of the chief seats of the woollen manufacture. **Dieppe** is the packet station to Brighton. **Beauvais**, famous for its cloth and tapestry. **Compiègne**, where the Maid of Orleans was taken prisoner by the English in 1431. **Noyon**, the birthplace of John Calvin, in 1509. **Evreux** has one of the finest cathedrals in France. **Chartres**, once the capital of Celtic Gaul, is the centre of a great corn trade. **Caen**, a large manufacturing town, famous for its lace, contains the tomb of William the Conqueror. **Alençon**, celebrated for lace and for crystal diamonds. **Cherbourg**, the Sebastopol of France, and one of her principal naval stations, situated at the northern extremity of the peninsula of Cotentin, within sight of the English coast; the works, long in progress, and now mounting 3000 guns, were formally opened on the 4th August 1858 by Napoleon III., in presence of Queen Victoria and a powerful English fleet. **Rennes**, the ancient capital of Brittany. **St Brieuc**, extensively engaged in the Newfoundland cod-fishery. **Quimper**, with a large pilchard-fishery. **Brest**, a first-class military port, and the principal station of the French navy, is strongly fortified and difficult of access.

WESTERN DEPARTMENTS.—These contain only two cities of more than 100,000 inhabitants (Bordeaux, Nantes); one between 100,000 and 50,000 (Angers); six between 50,000 and 20,000 (L'Orient, Rochefort, Angou-

lême, Niort, Perigueux; and twelve between 20,000 and 10,000. **L'Orient**, a military seaport, and one of the five principal stations of the French navy, with extensive shipbuilding. **Nantes**, one of the largest and most commercial cities in the west of France, with extensive shipbuilding docks: here was issued the famous Edict of Nantes, granting important privileges to the French Protestants, in 1598. **Angers**, the former capital of Anjou, with various manufactures, and extensive slate-quarries in the neighbourhood. **Saumur**, a stronghold of the French Protestants in the sixteenth century, is celebrated for its cavalry school. **Niort**, a thriving commercial and manufacturing town. **La Rochelle**, memorable for the siege which the Huguenots sustained against Louis XIII. in 1628, is a strongly-fortified seaport town. **Rochefort**, an important naval station fortified by Vauban, is a first-class military port. **Angouleme**, the former capital of Angoumois, has extensive trade, and is the birthplace of Montalembert, Balzac, and Margaret de Valois. **Cognac**, famous for its brandy, which is largely exported. **Bordeaux**, the ancient cap. of Guyenne, and the largest and most important city in the west of France, and its third commercial port, is the great emporium of the wine trade, and one of the principal seats of its foreign commerce. **Agen**, with a trade in prunes, is an entrepôt for the trade between Bordeaux and Toulouse.

THE SOUTHERN DEPARTMENTS have one town (Toulouse) above 100,000 inhabitants; two (Nîmes, Montpellier) between 100,000 and 50,000; nine (Baziers, Montauban, Bayonne, Pau, Perpignan, Cette, Carcassonne, Castres, Alais) between 50,000 and 20,000; and ten between 20,000 and 10,000. **Pau**, the capital of the old province of Béarn, is the birthplace of Henry IV., of Gaston de Foix, and of General Bernadotte, afterwards King of Sweden. **Bayonne**, a strongly-fortified seaport, in the extreme south-west of the kingdom, carries on an important trade with Spain, of which it forms the key; the *bayonet* was invented here. **Toulouse**, the most important and populous city in the entire south of France, was the capital of Languedoc; it is a sort of southern capital for literature and science, and contains the principal cannon-foundry in France: near it took place a sanguinary battle in 1814 between Wellington and Marshal Soult. **Perpignan**, the former capital of Roussillon, and an important military stronghold, has an extensive commerce in wines, wool, silk, iron, and corks. **Carcassonne** maintains an active trade in brandy. **Narbonne**, a very ancient city, founded by the first Roman colony sent into Gaul, was the residence of several Saracen kings in the middle ages: it is now celebrated for its honey. **Alby**: it was from this town that the Albigenses of the middle ages, who were so cruelly persecuted by the Church of Rome for their zealous maintenance of Gospel truth, derived their name. **Castres**, a place of great trade, manufactures, and mining operations, was one of the first cities in France that embraced the doctrines of Calvin—the birthplace of Dacier and Rapin. **Montauban** a large, well-built town, with several manufactures, and the seat of a Protestant theological seminary. **Montpellier**, one of the finest cities in the S.E. of France, with many literary and scientific institutions, is much frequented by invalids: it was an independent republic during the middle ages. **Beziers**, a fine town built on a hill, near the Orbe, suffered much during the crusade against the Albigenses in the thirteenth century. **Cette**, a fortified seaport town, at the entrance of the Canal du Midi. **Nimes**, a large, thriving, commercial city, with numerous manufactures of silk, cotton, and woollen goods, is the birthplace of Nicot, who introduced tobacco into France. **Beaucaire** has an immense annual fair,

where all kinds of merchandise may be found, and is frequented by merchants from all parts of Europe and Asia.

SOUTH-EASTERN DEPARTMENTS.—These contain one city (Marseille) above 100,000 inhabitants; two between 100,000 and 50,000 (Toulon, Nice); four between 50,000 and 20,000 (Avignon, Aix, Arles, Valence); and nine between 20,000 and 10,000. **Marseille** (Massilia), the most ancient city in France, having been founded by Greek colonists B.C. 600; and the third in France in regard to population: its commerce, which chiefly consists of wines and fruits, extends to all parts of the world. **Arles**, the ancient capital of Gaul, and afterwards of the kingdom of Provence, has been the seat of 13 ecclesiastical councils. **Avignon**, a flourishing manufacturing town, surrounded by plantations of mulberry-trees, was the residence of the Roman pontiffs during the seventy years of their "Babylonish captivity" (A.D. 1308-1377). **Orange** was the capital of an ancient principality of same name, which William of Nassau, the founder of the Dutch Republic, inherited; hence the King of the Netherlands is still Prince of Orange. **Toulon**, a first-class war-port, and the great naval station of the south of France: here Napoleon I. commenced his military career, during the memorable siege of 1793. **Nice**, originally a Greek colony from Massilia (*Marseille*), is celebrated as one of the earliest seats of Christianity in Europe: along with its territory, it was transferred by Sardinia to France in 1860: together with **Cannes** and **Mentone**, in the same department, it is much frequented by invalids from England and other countries. **Briançon**, the principal arsenal of the French Alps, is the most elevated town in Europe, being 4283 feet above the sea. **Valence**, noted for its cotton-printing and manufacture of silk goods.

EASTERN DEPARTMENTS.—The eastern departments contain one city (Lyon) of above 100,000 inhabitants; two between 100,000 and 50,000 (Strasbourg, Mulhausen); five between 50,000 and 20,000 (Besançon, Grenoble, Vienne, Le Creuzot, Colmar); and thirteen between 20,000 and 10,000. **Annecy**, capital of Upper Savoy, annexed to France by Sardinia in 1860. **Chambery**, cap. of department Savoie, also annexed to France in 1860, has a brisk trade in metals and wines. **Grenoble**, an impregnable stronghold on the Isere, formerly the capital of Dauphiné, was the first large town that opened its gates to Napoleon in 1815. **Vienne**, a thriving town, with lead and silver mines in the vicinity. **Lyon** (Lugdunum), at the confluence of the Rhone and Saône, is the second city in France in regard to population and commercial importance, and the first in manufacturing industry: it was founded by the proconsul Plancus, B.C. 43; became the capital of Roman Gaul, of the kingdom of Burgundy, and afterwards of the province Lyonnais; has numerous manufactures—that of silk being the most celebrated; and contains the finest provincial library in France: was the birthplace of Germanicus, of the emperors C. Aurelius and Caracalla, of the botanist Jussieu, of Jacquard and Camille Jourdan. **Maçon**, the centre of an extensive wine-trade. **Chalons-sur-Saône**, at the head of the Canal-du-Centre, carries on an extensive inland trade. **Lons-le-Saulnier**, so named from its famous saline spring, which yields annually 20,000 quintals of salt. **Besançon**, a strongly-fortified city on the Doubs, celebrated for its clocks and watches. **Colmar**, the fifth city in France as regards the cotton manufacture. **Mulhausen**, once the capital of a small republic, is noted for its printed cottons and silks. **Strasbourg**, a populous and strongly-fortified city, at the confluence of the Rhine and Ill, was formerly a free imperial city of Germany: it became subject to

France in 1681, and then became the capital of Alsace: it has a celebrated cathedral (founded in 504, but not finished till the fifteenth century), with a spire 466 feet high, which contains a remarkable astronomical clock, representing the movements of the planets in the solar system.

NORTH-EASTERN DEPARTMENTS. — These contain no town above 100,000 except **Paris**, which in 1868 had 1,825,000 inhabitants; three between 100,000 and 50,000 (Reims, Metz, Nancy); three between 50,000 and 20,000 (Versailles, St Quentin, St Denis); and sixteen between 20,000 and 10,000. **Metz**, at the confluence of the Moselle and Seille, is very strongly fortified, and contains an immense arsenal. **Nancy**, at the confluence of the Moselle and Meurthe, has extensive manufactures of cloth and embroidered muslin. **Luneville**, long the residence of Stanislaus, King of Poland, is chiefly famous for the treaty executed here in 1801 between the Emperor of Germany and the first Napoleon. **Langres**, the principal seat of the manufacture of cutlery. **Reims**, the principal seat of the woollen manufacture, is renowned in history for the maintenance of its liberties against the bishops in the middle ages: many ecclesiastical councils were held here, and in its colossal cathedral many of the kings of France were crowned. **Laon**: here was fought a sanguinary battle between Napoleon I. and the Allies under Blucher, in 1814. **Fontainebleau**, where Napoleon I. signed his abdication, was long the favourite residence of the kings of France. **Versailles**, famous for its magnificent royal palace, one of the most gorgeous in the world: many famous treaties were signed here, at one of which, in 1783, England recognised the independence of the United States of America. **Paris**, the capital of France, and the second largest city in Europe, is situated on both banks of the Seine, about 100 miles from its mouth. Less than half the size of London, it far surpasses the latter in magnificence, and is regarded by all as the most splendid city in Europe. It is surrounded by a fortified wall 21 miles in length, and a series of forts, erected by Louis Philippe at an enormous expense; and is adorned by sumptuous palaces, magnificent churches, and other public buildings, by fountains, gardens, triumphal arches, and columns. The University has twenty-eight professors, and the National Library contains 1,400,000 printed works and pamphlets, besides 125,000 MS. volumes. Paris is the birthplace of Condé, Prince Eugene, J. B. Rousseau, De Thou, Moliere, Boileau, Voltaire, Rollin, D'Alembert, and the painters Lebrun and David.

THE TWENTY-ONE CENTRAL DEPARTMENTS contain no town amounting to 100,000 inhabitants; but there are two between 100,000 and 50,000 (St Etienne, Limoges); ten between 50,000 and 20,000 (Orleans, Ze Mans, Tour, Dijon, Clermont-Ferrand, Troyes, Poitiers, Bourges, Nevers, Blois); and twenty-two between 20,000 and 10,000. **Le Mans**, with a brisk trade in grain and various manufactures. **Tours**, the former capital of Touraine, at the confluence of the Loire and Cher, with silk manufactures, and numerous schools and learned societies. **Blois**, with great trade in Orléans brandy. **Orléans**, the former capital of Orléannais, and at one time the capital of the kingdom of Burgundy, was besieged by the English in 1428, and delivered by the celebrated Joan of Arc, hence called "The Maid of Orléans." **Troyes**, the former capital of Champagne, is the centre of several important manufactures: here a treaty was concluded in 1420, conferring the crown of France on the King of England. **Poitiers**, formerly capital of Poitou, was in the possession of England for three centuries. **Chateauroux** has extensive manufactures of cloth, cutlery, hats, &c. **Bourges**, former capital of Berry, contains one of the

finest Gothic cathedrals in Europe. **Nevers**, former capital of Nivernais, has important manufactures of iron and steel goods. **Dijon**, the principal market for the sale of Burgundy wines, was formerly the capital of Bourgogne. **Limoges**, the former capital of Limousin, noted for its horse-races and its woollen manufactures. **Moulins**, formerly capital of Bourbonnais, with tanneries and manufactures of cutlery. **Tulle**, contains a national factory of firearms. **Clermont-Ferrand**, near the lofty mountain Puy-de-Dôme, and in the centre of a volcanic region. **Riom**, noted for being paved with basalt and lava quarried in the neighbourhood. **St Etienne**, a large thriving city, surrounded by coal-mines, and containing an active industrious population, who are largely engaged in the manufactnre of firearms and iron-ware. **Cahors** carries on a large trade in tobacco and red wines. **Le Puy** is celebrated for its cathedral, containing a small image of the Virgin, which the inhabitants devoutly worship under the appellation of "Our Lady of Puy." **Ajaccio**, the capital of Corsica, and the birthplace of Napoleon I. in 1769, carries on a trade in wine, oil, and coral.

Capes and Islands.—The following are the principal capes:—Gris-Nez (*Gréenay*), in Pas-de-Calais, the nearest point to England; Barfleur and La Hague, in the N. of Manche; Point St Matthieu and Raz Point in the W. of Finistère; Couquet, the extremity of the peninsula of Quiberon; Sicie, near Toulon. *Islands.*—Ushant and Belle Isle, S. of Morbihan; Noirmoutier and Ile Dieu, W. of Vendée; Ré and Oleron, W. of Charente Inférieure; Hières, S. of Var; Lerins, S.E. of Var; Corsica, a large island, between France and Italy, now forming one of the French departments.

Gulfs, Bays, and Straits.—Str. of Dover, 20 miles wide, bet. Picardy and Kent; Estuaries of the Somme and Seine; Bay of S. Malo, bet. Manche and Côtes-du-Nord; Estuary of the Loire, W. of Loire Inférieure; Estuary of the Gironde, bet. Charente Inférieure and Gironde; Bay of Biscay, bet. the W. of France and N.W. of Spain; G. of Lions, S.E. of France.

Surface and Mountains.—The face of the country is generally level, and its aspect monotonous and dreary. The want of ornamental plantations, and the almost total absence of hedges, give to the landscape an unusual degree of sameness. The principal mountain-ranges are situated on the S.W. and E. frontiers, and belong in part to the Hesperian, but chiefly to the Alpine system (see under "Europe," p. 69). They are all comprised in the following seven groups:—

The Pyrenees, between France and Spain, separating the basins of the Tet, Aude, Garonne, and Adour, from those of the Llobregat and Ebro—the loftiest summits (Maladetta, &c.) being within the Spanish frontier; Mont Perdu in Hautes Pyrenées, 10,994 feet; Mont Midi, in Basses Pyrenées, 9438 feet.

The Alps, between France and Italy, and between the basins of the Rhone and Po. The highest summits belonging to France are, Mont Blanc, in Haute Savoie, 15,781 feet, the culminating-point of Europe (unless we should except Mont Elburz, in the Caucasus, which is 18,571 feet); Mont Pelvoux, between Hautes Alpes and Isère, 13,440

feet; Mont Genèvre, 11,782 feet, and Mont Viso, 12,586 feet, both in Hautes Alpes.

Jura Mountains, between France and Switzerland, separating the basins of the Doubs and Aar; Mont Molleson, in Ain, 6588 feet; Reculet, 5632 feet.

Vosges Mountains, between Lorraine and Alsace, separating the Rhine from its affluent the Moselle; Ballon de Guebwiller, in Haut Rhin, 4694 feet; Ballon d'Alsace, 4123 feet.

Côte d'Or Mountains, in department of same name, separating the basins of the Seine and Loire from that of the Saône; Le Tasselot, 1968 feet.

Cevennes Mountains, in Languedoc, separating the basins of the Rhone and Saône from those of the Loire and Garonne; Mont Mezene, in Ardèche, 5820 feet; Mont Lozère, in Lozère, 4887 feet.

Auvergne Mountains, separating the basin of the Loire from that of the Dordogne and Garonne; Puy de Sancy, in Puy-de-Dôme, 6187 feet; Puy-de-Dôme, 4815 feet.

River-Basins.—Of the numerous river-basins of France, only 12 are of considerable magnitude—viz., the Loire, Seine, Rhone, Gironde, Somme, Vilaine, Charente, Adour, Tet, Rhine, Meuse, and Scheldt. The best authorities are greatly at variance in estimating the areas; and in some cases we can only make an approximation. It appears that these 12 basins comprise ⅘ths of the whole area of France, and 74 out of the 88 capitals, being ⅘ths of the entire number. Omitting the 5 basins which contain 1 capital each, the remaining 7 contain 67 capitals, or about ¾ths of the whole number, and their combined area (144,000 square miles) the same proportion of the entire area of France. The basin of the Loire alone contains 48,000 sq. m., and that of the Seine 26,000.

Table of Rivers and Towns.—The following table embraces all the rivers and towns of France enumerated under the "Political Divisions," the capitals of departments being distinguished by SMALL CAPITAL letters; towns above 10,000 inhabitants, by Roman letters, and smaller towns by *Italics*. The Rhine, Meuse, and Scheldt, being shown in their full development under Germany and the Netherlands, only the portions of them belonging to France are noticed here.

Basins inclined to the English Channel.

Rivers.	*Towns.*
Str. of Dover,	Dunkerque, Calais.
Colme,	*Bergues.*
Aa,	*Gravelines*, St Omer.
Lianne,	Boulogne.
Somme,	Abbeville, AMIENS, *Peronne*, St Quentin.
Maye,	*Cressy.*
Arques,	Dieppe.
Durdan,	*Yvetot.*
Co. Seine Inférieure,	Fecamp.
Seine,	Le Havre, *Honfleur*, ROUEN, Elbeuf, *Andely*, *Vernon*, St Germain-en-Laye, St Denis,
Seine—*continued.*	VERSAILLES, n., PARIS, Boulogne, Vincennes, *Gentilly*, *Sèvres*, *Corbeil*, MELUN, Fontainebleau, *Montereau*, TROYES.
Bolbec,	Bolbec.
Rille, *l.*	*Pont-Audemer*, *L'Aigle.*
Charente, *l*	*Bernay.*
Aubette,	*Darnetal.*
Eure, *l.*	Louviers, CHARTRES.
Iton, *l.*	EVREUX.
Blaise,	*Dreux.*
Epte,	*Vernon.*

Basins inclined to the English Channel (continued).

Rivers.	*Towns.*
Oise,	*Pontoise*, Compiègne, *Noyon*, *Chauny*.
Nonette, *l*	*Senlis*.
Terrein,	Beauvais.
Breches,	*Clermont*.
Aisne, *l*	Soissons, *Rethel*.
Vèle, *l*	*Reims*.
Delette, *l*	Laon.
Marne,	Paris, *Vincennes*, n., *Meaux*, *Chateau Thierry*, Epernay, Chalons-sur-Marne, *Vitry*, *St Dizier*, Chaumont, Langres.
Ornain,	Bar-le-Duc.
Essonne, *l*	*Corbeil*.
Juine, *l*	*Etampes*.
Loing, *l*	*Montargis*.
Yonne, *l*	*Montereau*, Sens, *Villeneuve*, Joigny, Auxerre, *Clamecy*.
Voisin,	*Avallon*.
Vouxie,	*Provins*.
Touques,	Lisieux.
Dives,	*Falaise*, n.
Ante, *l*	*Falaise*.
Orne,	Caen, *Argentan*, *Seez*.
Vere, *l*	Flers.
Drôme,	*Bayeux*, n
Vire,	St Lo, *Vire*.
Douve,	*Valogne*, n. (l. t.)
Divette,	Cherbourg.
Sienne,	*Coutances*, n. (r. t.)
Bosq,	Granville.
Seez,	*Avranches*.
Couesnon,	*Fougères*.
Co. Ille-et-Vilaine,	*Cancalle*.
Rance,	*St Malo*, St Servan, *Dinan*.
Gouet,	St Brieuc.
Co. Côtes-du-Nord,	*Plouha*.
Trieux,	*Guingamp*.
Guer,	*Lannion*, *Plouaret*.
Relec,	Morlaix.

Basins inclined to the Atlantic.

Elorn,	Brest, *Plougastel*, *Lambezellac*, *Landerneau*.
Odet,	Quimper.
Quimperlé,	*Quimperlé*.
Blavet,	L'Orient, *Pontivy*.
Evel, *l*	*Baud*.
Co. Morbihan,	Vannes, Sarzeau.
Vilaine,	*Redon*, Rennes, *Vitre*.
Isaac, *l*	*Blain*.
Oust,	*Redon*.
Duc, *l*	*Ploermel*.
Cher, *l*	*Fougeray*.
Ille,	*Combourg*.
Loire,	St Nazaire, *Montoir*, Nantes, *Chalonne*, Angers, n., Saumur, Tours, *Amboise*, Blois, *Beaugency*, Orleans, *Gien*, *Cosne*, *La Charité*, Nevers, Roanne, Montbrison, St Etienne, n., Le Puy.
Sèvre Nantaise, *l*	Nantes, *Verton*.
Moine,	Chollet.
Divale, *l*	*Vallet*.
Layon, *l*	Chalonne.
Mayenne,	Angers, *Chateau-Gontier*, Laval, Mayenne, *La-Ferté Macé*.
Ernée,	*Ernée*.
Sarthe,	Angers, *Sable*, Le Mans, Alençon.
Loir,	*La Flèche*, *Vendôme*, Chateaudun.
L'Huine,	*Nogent-le-Rotrou*.
Dive, *l*	*Mamers*.
Thouet, *l*	*Parthenay*.
Argentan, *l*	*Argentan*.
Vienne, *l*	*Chinon*, Chatellerault, *St Junien*, Limoges, *St Leonard*.
Creuse,	*Le Blanc*, Guéret, *Aubusson*.
Gartempe, *l*	*Montmorillon*.
Clain, *l*	Poitiers.
Indre, *l*	*Buzançais*, Chateauroux, *La Chatre*.
Cher, *l*	Tours, *Selles*, *Vierzon*, *St Amand*, *Montluçon*.
Saudre,	*Romorantin*.
Aron, *l*	Issoudun, n.
Auron,	Bourges.
Allier, *l*	Moulins, Clermont-Ferrand, *Issoire*.
Sioule, *l*	*St Pourçain*.
Andelot, *l*	*Gannat*.
Sichon,	*Cusset*.
Dore,	Thiers, *Ambert*.
Ambene, *l*	Riom.
Arroux,	Le Creuzot, n., Autun.
Furens,	St Etienne.
Lignon,	*Yssingeaux*, *Tence*.
Co. Vendée,	*Sable-d'Olonne*.
Lay,	*Luçon*, n.
Yon,	Napoleon-Vendee.
Sèvre Nior-taise,	Niort.
Vendée,	*Fontenay*.
Co. Charente Inférieure,	La Rochelle.

Basins inclined to the Atlantic (continued).

Rivers	*Towns*
Charente, ...	Rochfort, Saintes, *Cognac*, Angoulême.
Boutonne, ..	*St Jean d'Angely.*
Dordogne, ...	Libourne, Bergerac.
Isle, ...	Perigueux.
Loue, *l* ..	*St Yrieix.*
Vezère, ...	*Montignac.*
Corrèze, *l*	*Brives*, Tulle.
Ceon, *l*	*Gourdon.*
Sarlat, ...	Sarlat.
Cere, *l*	Aurillac.
Diege, ...	Ussel.
Garonne, ...	Bordeaux, *Marmande, Tonniens*, Agen, *Castel-Sarrasin*, Toulouse, *St Gaudens.*
Avance, *l* ..	*Marmande.*
Lot, ...	Villeneuve d'Agen, Cahors, Mende.
Celle, ...	*Figeac.*
Trueyn, *l*	*St Flour*, n.
Bayse, *l*	*Merac, Condom.*
Gers, *l*	*Lectoure*, Auch.
Tarn, ...	Moissac, Montauban, *Villemur, Rabastens, Gaillac*, Albi, Millhau.
Aveyron,	Villefranche, Rhodez.
Agout, *l* ..	*Lavaur*, Castres.
Adou, ..	*Graulhet.*
Sor, *l* ..	*Revel.*
Larn, *l*	*Mazamet*, n.
Sorgues, *l*	*St Afrique.*
Lers, ...	*Grenade.*
Giron, ...	*Puylaurens.*
Arriège, ...	*Pamiers*, Foix.
Adour, ...	Bayonne, Dax, Tarbes, *Bagnères-en-Bigorre.*
Gave-de-Pau, *l**	*Orthez*, Pau, *Olorn*, n.
Midouze, ...	Mont-de-Marsan.
Lees, *l*	*Aire.*

Basins inclined to the Mediterranean.

Tet, ...	Perpignan.
Aude, ...	Narbonne, Carcassonne, *Limoux.*
Fresquel, ...	*Castelnaudary.*
Orbe, ...	Béziers, Bedarieux.
Jean, ...	*St Pons.*
Herault, ...	*Agde, Pezenas.*
L'Ergue, ...	*Clermont-de-Lodève*, Lodève.
Arre, ...	*Le Vigan.*
Co. Hérault, ..	Cette, *Mèze.*
Lez, ...	Montpellier.
Vidourle, ...	*Lunel-la-Ville.*
Vistre, ...	Nimes.
Rhone, ...	Arles, *St Gilles*, Tarascon, Beaucaire, Avignon, *Le Pont St Esprit*, Montelimar, Valence, *Tournon*, Vienne, Givors, Lyon, Geneva, Lausanne, Vevay, *Martigny*, Sion or Sitten, *Visp, Leuk.*
Gardon, ...	Beaucaire, Alais.
Seine, *l* ...	*Uzès*, n.
Anduze, ..	Anduze, St Jean-du-Gard.
Durance, *l* ..	Avignon, *Cavaillon, St Remy*, n.. *Pertuis, Manosque, Sisteron.*
Calavon, ..	*Apt.*
Bleone, *l*	Digne.
Lure, ...	Gap.
Ouvèze, *l* ...	Avignon.
Auzon, *l* ..	Carpentras.
Sorgue, ...	*L'Isle.*
Aigues, *l* ...	Orange.
Ardèche, ...	*Aubenas.*
Ouvese, ...	Privas.
Drôme, *l* ...	*Crest.*
Isère, *l*	Romans, Grenoble.
Morge, ...	Voiron.
Cance, ...	Annonay.
Gier, ...	Rive-de-Gier, St Chamond.
Saône, ...	Lyon, Villefranche, Maçon, *Tournus*, Chalons-sur-Saône, *Auxonne, Gray.*
Azergue, ..	Tarare, n.
Reys-souse, *l*	Bourg.
Seille, *l* ..	*Poligny.*
Vallière, *l*	Lons-le-Saulnier.
Doubs, *l*	Dôle, Besançon, *Montbeliard, Pontarlier.*
Loue, *l*	*Arbois*, n., *Salins*, n.
Savour-euse,	*Belfort.*
Bouzoire,	Beaune.
Ouche, ...	Dijon.
Drejon, *l*	Vesoul.
Ain, ...	*St Claude*, n.

* The Gave-de-Pau issues from a lake fed by the glaciers of Mont Perdu, and then forms the Falls of Gavarnie or Marboré, the highest in Europe, descending with wild grandeur 1350 feet into the valley of Luz. Four other waterfalls, one of which is 600 feet high, leap over the rocks near the Marboré.

Basins inclined to the Mediterranean (continued).

Rivers.	*Towns.*
Savière, *l*...	Drains Lake Bourget.
Leisse,...	CHAMBERY.
Fieran, *l* ...	ANNECY.
Arve, *l*	GENEVA.
Etang-de-Berre,	*Les Martigues.*
Touloubre,	*Salon.*
Arc, ...	Aix.
Verne, ...	MARSEILLE, *Aubagne, Auriol.*
S.E. Coast,...	*La Ciotat,* Toulon, La Seyne, *Antibes.*
Gapeau, ...	Hières.
Argense, ...	*Lorgues.*
Artuby, *l*...	DRAGUIGNAN.
Calami, ...	*Brignoles.*
Siagne, ...	*Cannes.*
Esteron, *l* ..	Grasse.
Paglione, ...	NICE.
Co. of Nice,...	*Monaco, Mentone, Ventimiglia.*

Basins inclined to the North Sea.

Rhine, ...	STRASBOURG, Guebwiller, n.
Moselle, *l* ..	*Thionville,* METZ, *Pont-à-Mousson,* NANCY, *Toul,* EPINAL, *Remiremont.*
Sarr, ...	Saarbrück, *Sarreguemines.*
Meurthe,	NANCY, Lunéville, St Diey.
Madon, *l*	*Mirecourt.*
Moder, *l*....	Haguenau, *Bischwiller.*
Zorn,	*Saverne.*
Ill, *l*.....	STRASBOURG, Schelestadt, COLMAR, Mulhausen.
Bruche, *l*	*Oberheim.*
Liepvrette, *l*	St Marie-aux-Mines.
Thaur, *l* ..	Mulhausen, *Thann.*
Meuse, ...	*Givet,* Charleville, MEZIÈRES, Sedan, Verdun, *St Mihiel.*
Sambre, *l*...	Maubeuge.
Scheldt, ...	*Condé, Anzin,* Valenciennes, Cambrai.
Lys, *l*.....	Tourcoing, n., *Commines,* Armentières, Halluin, Bailleul, n., *Merville, Aire.*
Deule,....	Waltrelos, Roubaix, n., LILLE, *Carvin-Epinoy, Lens.*
Beurre, *l*	*Hazebrouck.*
Lawe, ...	Bethune.
Scarpe, *l*...	St Amand-les-eaux, Douay, ARRAS.
Selle,	*Solesmes, Le Cateau.*

Lakes.—France is singularly devoid of lakes, and the few that exist are of very small dimensions. Grand Lieu, the largest of them, in the department Loire Inférieure, occupies only 20 sq. miles, and St Point, in department Jura, 3 sq. miles. But there are numerous lagoons, or salt marshes, called *Étangs*, in the S.W. and S.E. departments, from which large quantities of salt are annually produced. The principal are Carcans and Certes, in Gironde; Sanguinet and Biscarosse, in Landes; Leucat and Sigeau, in Aude; Thou, in Herault; and Etang de Berre, in Bouches-du-Rhone.

Climate.—France lies between the isotherms of 50° and 60°, hence the climate is scarcely surpassed by that of any country in Europe, though, owing to the great extent of its surface, there are great diversities. Thus, in the N.W. departments, it greatly resembles the S. of England; in the N.E. the winters are long and often severe; in the S.E. the sky is almost always serene, and the winters of short duration. The mean annual temperature in the N. is 50°, and in the S. 60° Fahr., the mean temperature of the capital is slightly greater than that of London, but is 2° higher in summer, and as many lower in winter. Mean annual rain on the W. coast, 24 inches, S. 23, N. 22 inches; rainy days at Paris, 105; on W. coast, 152; in the interior, 147; but on the coast of the Mediterranean, only 66. The hot

winds of Africa frequently spread desolation in the S.E. departments, while the S.W. are exposed to piercing winds and tempests from the Pyrenees and Bay of Biscay. The olive is successfully cultivated in the S.E.; the general cultivation of maize extends northward to a line drawn from Bordeaux to Strasbourg; the vine is profitably cultivated as far north as a line connecting the mouth of the Loire with Mezières on the Meuse, while N. of this line is the region of wheat, flax, and beetroot.

Geology and Minerals.—The geology of France is as varied as that of England, comprehending all the formations of the geological scale. The secondary strata, however, are the most highly developed, and cover the largest portion of the surface. They prevail chiefly in the E. and N.E. departments, from the Mediterranean to Metz on the Moselle. They also cover a large part of the W. of France, extending from the Garonne to the mouth of the Seine, but not including Brittany, which is nearly all Silurian. The next in importance is the tertiary series, which occupies the region between the Pyrenees and Garonne; an extensive tract along the E. side of the Rhone and Saône; and a still more extensive area around the capital, known as the *Paris basin*, and celebrated as the field in which the great Cuvier made his remarkable palæontological discoveries. Granitic rocks occur in many places, but prevail especially in Brittany, and along the great water-parting separating the basins of the Loire and Garonne; and, lastly, volcanic rocks are numerous in Cantal and Puy-de-Dôme, where they form an irregular ridge of mountains, consisting chiefly of extinct volcanoes. The most abundant coal-deposits are found in the central departments, especially in the basins of the Loire, Creuse, Dordogne, Aveyron, Ardèche, and Rhone, and in the mountains of Cevennes. An extensive coal-field extends from Boulogne in an easterly direction to Belgium, and forms a source of great wealth to the flourishing cities of the N. coast of France; but it is a curious fact that coal in France is unaccompanied by ironstone, a mineral which so greatly enhances its value in England and Scotland. The next most important mineral is iron, found in all parts of the kingdom, and worked to the extent of half a million of tons annually; coal, as already described, wrought in 400 coal-mines, and yielding upwards of 11,000,000 tons annually; salt-mines of great value; copper, lead, silver, antimony, and small quantities of gold, sulphur, and sulphate of iron; marble, gypsum, alabaster, building-stone, and slate, in many localities.

Botany.—France surpasses all other European countries in the number and variety of its indigenous plants. Thus, while the indigenous plants of the British Isles amount only to 4400 species, of which 1600 are flowering, France contains 7000 species, of which 3540 are flowering, or, according to Martins, 3660, of which 713 are monocotyledons and 2950 dicotyledons. The principal *forest-trees* are the different varieties of the pine tribe, as common fir in Vosges and Jura, and the larch in the loftier Alps; the oak, beech, elm, ash, birch, and cork-tree. Forests occupy about 17,000,000 acres, being

nearly an eighth of the entire surface, and are the more valuable in that they thrive in soils which could not otherwise be turned to good account. The principal *fruit-trees* are the vine, olive, chestnut, walnut, almond, apple, pear, cherry, orange, citron, fig, pomegranate, pistachio, lemon, and plum.

Agriculture.—Except on the borders of Belgium, agriculture is in a backward state, though the recent improvements have been extensive, and the implements used in husbandry are of an inferior description. The British system of rotation of crops is unpractised, and large farms are unknown. This is mainly owing to the extreme subdivision of property. When a landed proprietor dies, the land is equally divided among all his children. The result is that there are now in France about 8,000,000 landed proprietors, of whom 50,000 possess on an average 600 acres each; 2,500,0000 have 60 acres each, while 5,000,000 have only 6 acres each. The soil is in general of moderate fertility, but in many places very rich: $\frac{1}{4}$ is under cultivation, $\frac{1}{9}$th occupied with forests and fruit-trees, $\frac{1}{10}$th in permanent meadows, and $\frac{1}{9}$th in unreclaimod waste land. Vineyards now occupy about a twentieth part of the entire area, and the French are allowed to be the best winemakers in the world. The most celebrated wines are those of Champagne, Burgundy, and Bordeaux. Wheat and the vine form the principal objects of culture, and next to them barley, oats, rye, buckwheat, Indian-corn, peas, beans, potatoes, and flax. Wheat is grown chiefly in the north, where the vine cannot be cultivated successfully; maize in the south; and rye throughout the whole country. The quantity of corn raised is usually sufficient for the wants of the population, and considerable quantities are often exported. Mulberry-trees form an important article of culture, especially around Lyon; beet-root, from which sugar is largely manufactured; tobacco and madder are also cultivated in several departments, but the olive almost exclusively on the coast of the Mediterranean. In the rearing of cattle and sheep France is far behind Great Britain, but poultry are very extensively reared.

Zoology.—Among the wild *Mammalia* may be reckoned the black and brown bear in the Pyrenees; the lynx in the higher Alps; the wolf and wild boar in the forests; the chamois and wild goat in the Alps and Pyrenees; the stag, roebuck, hare, rabbit, and fox, are common; the marmot, ermine, hamster, the red, alpine, and flying squirrel in the Vosges; the badger, hedgehog, polecat, weasel, rat, mouse, and mole, everywhere; the beaver is found on the banks of the Rhone; the otter and water-rat in most of the other rivers. *Birds.*—The songsters and the birds of passage are much the same as in England; the flamingo is found on the shores of the Mediterranean; the red and grey partridge, quail, pheasant, woodcock, plover, lapwing, wild-duck, and snipe are common; the eagle, falcon, and buzzard in the mountains. *Reptiles* are represented by numerous species of frogs, including the salamander, by a few tortoises, and by several species of vipers and of harmless snakes. *Fishes.*—The herring, mackerel, sardine, pilchard, turbot, sole, whiting, on the west coast; the tunny and anchovy in the Mediterranean; and the salmon in the river-estuaries. The *Articulata* include the crab, lobster, crayfish, and numerous insects, among which may be mentioned bees, which are extensively reared; and the silkworm, which

forms a highly important source of wealth. Of *Mollusca*, the oyster and mussel form important articles of food.

Ethnography.—In ancient times France (formerly Gallaia, or Gaul) was inhabited by three different races—viz., the Aquitani in the S., an Iberian race; the Celts in the centre, a Gallic race; and the Belgæ in the N., a Gothic race. The French people are therefore of a mixed race, partly Teutonic, but chiefly Roman and Celtic. The Gauls, or Celts, were the original inhabitants, but were invaded early in the fifth century by the Franks, Burgundians, and Visigoths, a confederacy of German tribes who had previously occupied the right bank of the Rhine. In Brittany the Celtic element remains almost pure, and the Basque in Bearn; while Flemish is spoken in French Flanders, German in Alsace, and Italian in the S.E.

The French *Language* is an important member of the Greco-Latin family. The country having been long subject to the Romans, the original language of the inhabitants was displaced by the Latin, which was in turn greatly corrupted by the Franks. The Armoric, however, a purely Celtic dialect, continues to be spoken in Brittany; and the Basque, which cannot be classed under any known family, is spoken in the extreme S.W.

Religion.—The great bulk of the population are nominal adherents of the Church of Rome. In 1866 upwards of 36,000,000 belonged to that faith, while only 1,500,000 were Protestants, and 158,000 Jews. The majority of the Protestants are Calvinists, but Lutherans are numerous in Alsace. Protestants, and even Jews, are endowed by the State, as well as the dominant religion; but the amount of toleration shown to those denominations who will not submit to State control is very limited.*

In regard to *Education*, France occupies the middle place among the nations of Europe, standing above Scotland and below Austria. While 60 per cent of the population between the ages of seven and fourteen attend the primary schools, popular instruction is very unequally distributed; for while in the eastern and northern departments $\frac{9}{10}$ths of the adult community can read and write, only $\frac{1}{10}$ths can read and write in the centre and west. In 1833 a system of national education was established, and every commune (or parish) is now obliged to maintain at least one elementary school, at which, however, attendance is not compulsory. There are 82,135 elementary schools in France, and the number of children attending such schools in 1862 was 4,731,946. The universities are four in number—viz., those of Paris, Poitiers, Toulouse, and Montpellier. These are parted out into colleges, there being commonly one college in every department; but the Roman Church educates its clergy in its own ecclesiastical seminaries, in which the curriculum is very limited. In intellectual character the French people occupy a foremost place; while for exquisite taste, politeness, and courtesy of manners, they are unrivalled among the nations. In moral qualities, however, they are

* In January 1858 a decree was issued intimating that the Protestants now in the country must be contented with being tolerated exactly in their present condition. No attempts at proselytism will be allowed; no new churches or new schools will be tolerated; and, as a climax to this piece of religious oppression, it is further intimated that all attempts to discuss religious questions will be treated as sedition, and suppressed accordingly. On the whole, Protestantism has hardly been in a worse condition in France since the reign of Louis XIV.

less favourably distinguished; they are deficient in solidity of character and strength of principle; incapable alike of bearing prosperity or adversity. Fickleness of disposition and a passion for military glory are prominent features of their character. Licentiousness of manners is another distinguishing trait, especially in large cities: in the capital, for instance, every third mother is unmarried, and every third child has a stain on his birth; but over the whole country the proportion is only one to fourteen.

Literature.—Though France cannot boast of many geniuses of the first order, a great number of brilliant names adorn her literature. The following are amongst the most distinguished of her many gifted sons:—

POETRY: Molière, Racine, Corneille, La Fontaine, Boileau, Crebillon, Voltaire, Beranger, J. B. Rousseau, Hugo, Dumas, Musset. HISTORY: Froissart, Rapin, Voltaire, Rollin, Comines, De Thou, Sully, Barante, Thierry, Thiers, Mignet, Guizot. FINE ARTS: Poussin, Vouet, Claude Lorrain, Vanloo, Le Sueur, P. Mignard, Charles le Brun, Watteau, Vernet, Greuze, David. PHYSICAL SCIENCE: La Place, Lavoisier, Lagrange, Lalande, D'Alembert, Buffon, Réaumur, Jussieu, Cuvier, Arago, Balbi. MENTAL SCIENCE: Descartes, Malebranche, Gassendi, Bayle, Condillac, Montesquieu, Cousin. PULPIT ELOQUENCE: Bourdaloue, Bossuet, Fénélon, Massillon. SACRED LITERATURE: Calvin, Beza, Pascal, Bochart, Daille, Tillemont, Le Long, Dupin, Fleury, Basnage, Saurin, Le Clerc, Calmet, Houbigant. MISCELLANEOUS: Rabelais, Montaigne, H. and R. Stephens, Casaubon, Salmasius, Herbelot, Sévigné, Du Cange, Montfaucon, Le Sage, Fontenelle, Marmontel, Diderot, St Pierre, Volney, De Sacy, Champollion, Chateaubriand, La Bruyère, La Rochefoucauld, Talleyrand, Hugo, Dumas, Musset, Balzac, De Kock, Eugene Sue, Lamartine.

Form of Government, Army and Navy, Public Debt, Revenue and Expenditure.—Formerly a republic, France has since 1852 been under an imperial despotism, the reigning sovereign being Napoleon III., formerly Prince Louis Napoleon, President of the Republic, and nephew of Napoleon the Great. The press is fettered, and there are but few remains of popular freedom; but in general the country is enjoying unwonted prosperity. In 1869, the standing army amounted to 404,794, but during the late war with Russia it amounted to 590,000. The navy, in 1868, consisted of 59 ironclads, 237 unarmoured vessels, 73 paddle steamers, and 111 sailing vessels—in all, 480 vessels, mounting 2750 guns, and manned by 43,080 seamen. The public debt amounts to £348,000,000, being less than half of that of Britain, and costing the country about £20,000,000 annually. The gross revenue for 1868 amounted to £87,600,000 sterling, and the expenditure to about the same sum, of which £20,000,000 were expended on the interest of the debt; £20,000,000 on the army and navy; £20,000,000 on account of collection and public order; and the remainder in meeting the minor obligations of the Government.

Commerce, Manufactures, Exports and Imports.—France ranks next to Britain, in regard to the extent and value of her commerce and manufactures. In 1867, the commercial marine comprised 15,637 vessels, carrying 1,042,000 tons, or about a fifth part of the tonnage of Great Britain; the total exports amounted to £160,000,000, and the imports to £140,000,000. Her chief customer is England, her trade

with that country having increased more than 150 per cent since the treaty of commerce of 1860. The other principal countries are Belgium, Italy, Netherlands, and Spain. In 1867, France exported to our country goods to the value of £33,740,000, the chief items of which were silk and silk goods (£10,000,000), wines and brandy (£3,000,000); gloves, butter, and eggs (£4,000,000). In the same year France received from us to the value of £12,031,000, consisting mainly of woollen, cotton, and linen goods, coal, and iron. Her principal imports from other countries are raw silks, wool, sugar, cotton, wood, and coal. With respect to manufacturing industry, France is divisible into three regions, which, in the order of their importance, are the northern, southern, and central. The northern towns (especially Rouen) are the chief seats of the cotton and woollen manufacture; while the linen manufacture is chiefly confined to Lille, Cambray, and the other towns bordering on Belgium; silk-weaving is chiefly prosecuted at Lyon, and other cities in the valley of the Rhone. St Etienne is the chief seat of the manufacture of firearms and hardware. Paris is remarkable for the great variety of its manufactures, especially articles of taste, luxury, and fashion—as jewellery, bijouterie, porcelain, mirrors, clocks, watches, perfumery, bonnets, gloves, carriages, and "Articles de Paris." The glove manufacture is one of the most important branches of industry in the country, Paris being its chief seat. Caen and Valenciennes are famous for their lace, Cambray for muslin, Reims for merinoes; while the manufactures of beet-root-sugar, wine, and brandy, are of the highest importance.

Inland Communication.—As compared with England and Belgium, RAILWAY communication is still in a backward state. Previous to 1840, there were but few lines in the kingdom. In 1854, the number of miles open for traffic was 2526, while at the close of 1869 there were 10,090 miles in operation. Nearly all the lines are at present in the hands of six great companies, and all the grand systems radiate from Paris, as a centre, to the extremities of the kingdom. Commencing at the capital, 1st, the NORTHERN, proceeds to Amiens, and then branches to Brussels and Boulogne; 2d, the WESTERN runs to Rouen, where it forks to Dieppe, Havre, and Cherbourg; 3d, the ORLEANS line proceeds S.W. to Tours, where it branches off to Nantes and Bordeaux; 4th, the LYON and MEDITERRANEAN, to Lyon and Marseille; 5th, the SOUTHERN, from Bordeaux to Montpellier; 6th, the EASTERN, from Paris to Nancy, branching off to Metz and Strasbourg. CANALS: There are eighty-six canals, whose united length is 2350 miles, and which connect all the principal rivers of France. The most important are the following: *Canal du Midi*, from Toulouse, on the Garonne, to the lagoon of Thou, connects the Atlantic and Mediterranean. *Canal du Centre*, from Chalons-sur-Saône to Digoin in Saône-et-Loire, unites the Loire with the Rhone. *Rhine and Rhone Canal*, partly in the line of the Doubs, unites the Rhine and Rhone. *Canal de Burgogne*, from the Saône to the Yonne, connects the Rhone with the Seine. *Canal du Braire*, connecting the Seine with the Loire. The ROADS are divided into two classes—viz., Royal and Departmental. Of the former there are twenty-six, whose united length is 24,900 miles; and of the latter, ninety-seven, with a united length of 22,500—making a total of 47,400 miles.

Foreign Possessions.—The foreign possessions of France have an

aggregate area one and a half times greater than its home territory; but their population is not more than one-sixth that of the latter.

They consist principally of Algeria (Fr. *Algérie*), in Africa, and French Guiana, in South America, which are by far the most important; together with Senegal, Goree, &c., on the W. coast of Africa; the island of Reunion, in the Indian Ocean; Mahé, Karikal, Pondicherry, Yanaon, and Chandernagore, in Hindostan; St Pierre and Miquelon, in the Gulf of St Lawrence; Martinique, Guadeloupe, and a few other islands in the West Indies; New Caledonia, Loyalty Is., Tahiti, Marquesas, and the Gambier archipelago, in Oceania. France also lays claim to a large territory in the S. of Cochin China, with a population of 1,000,000. Total area of the colonies, including Algeria and Cochin China, 288,951 square miles; population, 5,648,802.

BELGIUM.

Position and Boundaries.—N., the Netherlands; N.W., the North Sea; S.W. and S., France; E., Dutch Luxembourg, Rhenish Prussia, and Dutch Limbourg. Lat. 49° 30′—51° 30′ N.; lon. 2° 33′—6° 5′ E.

Brussels, the capital, situated nearly in the centre of the kingdom, is nearly on the same parallel with Cape Clear in Ireland, Dover in England, Dresden, Breslau, Lublin, Tchernigov, Uralsk, on the continent of Europe, and Irkutsk in Siberia; and nearly on the same meridian with the Hague, Lyon, and Minorca. The form approaches an isosceles triangle, with the base or longest side resting on France. Length along the base, 190 miles; and the greatest breadth from the apex of the triangle to the base, 115 miles. The coast-line is small, measuring only 40 miles; but the Maas and Scheldt, with their principal affluents, being navigable, and the country being intersected by railways and excellent canals in all directions, the commercial facilities are very great.

Surface.—The greater part is level, and but little elevated above high-water mark; but the southern provinces form a slightly inclined plane, sloping towards the north. Natural barriers, consisting of sandhills 50 or 60 feet high, protect the country from the inroads of the sea; while numerous artificial banks have been constructed along the rivers to save the country from inundation. Belgium is destitute of mountains, but the southern and eastern provinces are traversed by the heights of Ardennes, which enclose the valley of the Maas, and separate it from the basin of the Moselle; highest point, Stavelot, near Liège, 2000 feet.

Area and Population.—The area is 11,408 sq. miles, being nearly twice as large as Yorkshire, or 1¾ acre to each inhabitant. In 1867 the population was 4,897,794, being 440 persons to each sq. mile. Belgium is therefore the most densely peopled state in Europe. The northern provinces are the richest and most populous, East Flanders having 706 inhabitants to the sq. mile.

Political Divisions.—The kingdom is divided into nine provinces, each of which is subdivided into arrondissements, communes, and cantons. Commencing at the North Sea, and proceeding eastward and southward, the provinces and towns are enumerated in the following table :—

West Flanders.*—BRUGES 47, Ostend 17 (Ostend Canal), Courtrai 23, Menin 10 (Lys), Thielt 10 n., Roulers 14 (Mandel), Ypres 16 (Yperlée), Poperinghe 11 (Vleterbeque).

Towns between 5000 and 10,000 inhabitants.—Werwick, Warneton, Meulebeke, Ingelmünster, Iseghem, Thourout.

East Flanders.—GHENT 117, St Nicholas 23, Zele 10 n., Renaix 12 n. (Scheldt), Lokern 17 (Duvine), Alost 19 (Dender).

Themsche, Dendermonde, Wetteren, Oudenarde. Hamme, Eecloo.

Antwerp.—ANTWERP 124 (Scheldt), Mechlin or Malines 36 (Dyle), Lierre 15 (Nethe), Turnhaut 14 n. (Little Nethe).

Boom, Gheel.

Limbourg.—HASSELT 10 (Demer), St Trond 11 (Geete), Tongres 6 (Jaar).

Liege.—LIEGE 102, Herstal 6, Huy 11 (Maas), Verviers 32 (Vesdre).

Belgian Luxembourg.—ARLON 6 (Semoy, *aff.* Maas).

Namur.—NAMUR 22, Andenne 6, Dinant 7 (Maas).

Hainault.—MONS 23 (Haine), Charleroi 13 (Sambre), Tournay 32 (Scheldt).

Binche, Peruwelz, Lessines, Ath, Leuze, Soignies, Braine-le-Comte, Paturages, Jumetz, Gilly, *Fleurus, Fontenoy.*

South Brabant.—BRUSSELS, including the 8 adjacent communes, 308 (Senne), Louvain 33 (Dyle), Tirlemont 12 (Geete).

Assche, Vilvorde, Hal, *Waterloo*, Nivelles, Wavre, *Genappe*, Diest, *Ramillies, Quatre Bras, Ligny.*

Descriptive Notes.—There are in Belgium four towns of above 100,000 inhabitants (Brussels, Antwerp, Ghent, Liege) ; none between 100,000 and 50,000 ; nine between 50,000 and 20,000 (Bruges, Mechlin, Louvain, Verviers, Tournay, St Nicholas, Courtrai, Mons, Namur) ; and fifteen between 20,000 and 10,000.

Bruges (*Flem.* Brugge, "bridges") owes its name to the numerous bridges which cross the canals intersecting it, is a fortified city, capital of the province, and formerly one of the greatest marts of commerce in Europe ; began to decline in the fifteenth century, when the religious persecutions of Philip II. obliged many of the inhabitants to seek refuge in England ; still noted for its lace, damask, and linen manufactures : here oil-painting and decimal arithmetic had their origin. **Ostend**, the only maritime town of Belgium, and the principal port for the herring-fishery, is the packet-station for England, and is strongly fortified ; has shipbuilding docks, and is much resorted to for sea-bathing : here terminates the great system of canals which intersect the kingdom. **Courtrai**, a fortified town with important manufactures of damask. **Ghent** (*Fr.* Gand), at the confluence of the Scheldt and Lys, a walled and fortified town intersected by numerous canals, which are crossed by 300 bridges : from the great extent of its cotton manufactures, it has been called the Manchester of Belgium : it is the seat of one of the four universities, and the birthplace of

* The pronunciation of Belgian proper names does not in general differ essentially from that of the Dutch ; for which, see under "Netherlands."

Charles V. and John of Gaunt. **St Nicholas** and **Lokern** are also chief seats of the cotton manufacture. **Oudenarde**, celebrated for the victory gained by the Duke of Marlborough and Prince Eugene over the French, in 1708. **Antwerp** (*Fr.* Anvers), a large and very strongly fortified city on the Scheldt, and the chief emporium of Belgian commerce, contains a noble cathedral, many valuable works of art, and extensive manufactures, the chief of which are silk and cotton hosiery: in the 13th and 14th centuries it was the wealthiest and most commercial city in Europe. Here died the illustrious Rubens in 1640, and it is the birthplace of Jordaens, Vandyk, and Teniers. **Mechlin** (*Fr.* Malines), on the Dyle, and at the intersection of several railways, is a place of great trade, especially in flax, corn, and oil. **Liège** (*D.* Luyk, *G.* Lüttich), a fortified and populous city on the Maas, is called the Birmingham of Belgium, on account of its vast ironworks and extensive coal-mines; long celebrated for the manufacture of arms, which it largely exports to foreign governments. **Verviers**, noted for its woollen cloth, soap, and dye-works. **Huy** (We), a fortified town, with a college, ironworks, several factories, and an active trade in corn, is the burial-place of Peter the Hermit. **Namur**, a fortified city at the confluence of the Maas and Sambre, is celebrated for its cutlery: it has extensive manufactures of iron, steel, and bronze articles; its cathedral is one of the finest in Belgium: in the vicinity are rich mines of coal, iron, lead, and copper. **Mons**, a fortified city on the Haine, with numerous coal-mines in the vicinity. **Tournay**, a strongly fortified city on the Scheldt, has a royal factory for the manufacture of Brussels carpets. **Charleroi**, a celebrated fortress which has been taken by the French no less than six times, lies near the centre of an extensive and valuable coal-field; is well situated both for manufactures and trade. **Fleurus**: various sanguinary battles took place in its vicinity in 1622, 1690, 1794, and 1815. **Fontenoy**, a village five miles S.E. of Tournay, memorable as the place where, in 1745, the British were defeated by the French. **Brussels** (*Fr.* Bruxelles), capital of Belgium, is adorned with many fine buildings, fountains, and public walks of great beauty. It is the chief seat of public instruction, contains a university, and numerous other literary and scientific institutions, and is noted for book-printing, especially its cheap reprints of French works. Brussels was long celebrated for its carpets and lace, but the former branch of manufacture has now greatly declined. Brussels is an ancient city, having been founded probably in the seventh century: was the residence of the Dukes of Brabant, and afterwards of the Spanish and Austrian governors-general of the Netherlands. **Louvain**, once the seat of a famous university, now replaced by a Roman Catholic college. **Waterloo**, a village 9 miles S. of Brussels, famous for the great battle fought near it, June 18, 1815, between the French under Napoleon I., and the British under the Duke of Wellington, when Napoleon was utterly defeated. **Ramillies**: here the Duke of Marlborough defeated the French, 23d May 1706. **Quatre Bras**, a village 10 miles S. of Waterloo, and the scene of an indecisive action between the French and the British (with their allies), 16th June 1815, in which the Duke of Brunswick fell. **Ligny**, a village 14 miles W.N.W. of Namur, celebrated for a battle between the Prussians and French, 16th June 1815.

River-Basins. — The Maas (*Fr.* Meuse) and the Scheldt (*Fr.* Escaut) are the only rivers of Belgium that deserve attention. The former has a total length of 580 miles, and the latter of 211 miles; but only a part of their course belongs to this kingdom. Of the

nine capitals of provinces above enumerated, three belong to the Maas—viz., Liège, Namur, and Arlon; and five to the Scheldt—viz., Antwerp, Ghent, Brussels, Hasselt, and Mons. For the table of rivers and towns, see under "Netherlands," where the complete river-system of both countries will be found.

The Climate is in general temperate, mild, and agreeable, but humid in the N. and N.W. The mean temperature of the year at Brussels is 50°.4, winter 38°, summer 64° Fahr.; the range of temperature is very great—the extreme heat being 91°.6, and extreme cold 3° below zero. The prevailing winds are from the S.W., and the annual fall of rain is about 26 inches.

Geology and Minerals.—Tertiary formations cover the whole N.W. and centre; but in the E. and S. carboniferous and Devonian strata prevail, containing many extensive and valuable coal-fields, especially in the provinces of Hainault, Namur, and Liège. The minerals are numerous and highly important, embracing coal and iron, which are wrought most extensively around Mons, Liège, and Charleroi: 83 coal-beds are enumerated, which yield annually about 10,000,000 tons of coal, a third of which is exported to France, whose entire coal-fields are inferior to those of Namur alone. With the exception of England, Belgium is the best coal-producing country in Europe. Liège alone produces 200,000 tons of iron annually; and many other iron-mines are wrought between the Maas and the Sambre. Other minerals are, copper in Hainault and Liège; lead in Liège, Namur, and Luxembourg; calamine, or carbonate of zinc, in Namur, Liège, and Hainault; also manganese, sulphur, alum, slate, and building-stone, and several other useful minerals.

Botany, Agriculture, and Zoology.—The indigenous vegetation of Belgium differs so little from that of the north of France and the south of England, that it is unnecessary to describe it. Among the forest-trees are the oak, chestnut, beech, elm, ash, walnut, fir, and poplar. Agriculture is in a highly flourishing state, and has long served as a model to neighbouring countries. The soil is not naturally fertile, as it generally consists of either sand or clay, but the skill and industry of the husbandman have so judiciously mixed these ingredients that Belgium may now be regarded as the richest and most productive country in Europe. The rotation of crops is carefully attended to; artificial manures are largely employed; and the result is, that though the country is so densely peopled, the quantity of corn raised is double that required for home consumption. Seven-eighths of the entire surface are under cultivation, and the remainder yields excellent timber for bark and building purposes. Clover forms an extensive article of farming and the chief food of the cattle, which are usually stall-fed, the seed being exported to England. The flax is of an excellent quality, and is also largely exported. The vine is cultivated on the banks of the Maas, but the wine is of an inferior quality. Hops, beetroot (for sugar), chicory, and tobacco, are grown in the central provinces; potatoes, flax, oil-seed, and madder, in Flanders; and wheat, rye, barley, oats, and

buckwheat, everywhere. The principal wild animals are the roe-buck, wolf, bear, and wild boar. The moors around Verviers are said to be the only asylum in Continental Europe for the heath-cock. Among domestic animals may be reckoned horses, horned cattle, sheep, and pigs, all of which are reared in great perfection. Flanders is specially noted for its breed of horses. The culture of bees and of the silkworm is also pursued to great advantage.

Ethnography.—Two races of people are found in Belgium—a Teutonic and a Greco-Latin—the Flemings proper being of German, and the Walloons of French extraction. The *Belgæ* formed one of the three great nations into which Cæsar found the population of Gaul divided, when their territory extended from the Rhine on the N. to the Seine and Marne on the S. They had, in Cæsar's time, driven out, or reduced to subjection, the former inhabitants, who appear to have been Celts; but the Belgæ themselves had crossed the Rhine from Germany. The *Walloons* in the S.E. are mixed Celts, and the name bears an affinity to the terms *Wales* and *Welsh* of our country.

The *Languages* are three in number—French, Walloon, and Flemish. Modern *French* is the language of the court, of the legislature, of society, and of literature. The *Walloon* is a dialect of the French, or rather it is the same as the French of the thirteenth century, and is spoken by 1,800,000 in Hainault, Namur, Liège, and Luxembourg. The *Flemish* is spoken by about 2,400,000, chiefly in Flanders, Antwerp, S. Brabant, and Limbourg: it is closely allied to Dutch, and is, in fact, merely the Dutch of the preceding century. It differs from modern Dutch chiefly in orthography and pronunciation; is less guttural, and has adopted many French words. German is spoken in a part of Luxembourg. *Religion.*—The population of Belgium belong almost exclusively to the Roman Catholic Church, there being but 13,000 Protestants and 2000 Jews; but other denominations are not only tolerated, but their churches are supported by the State, and Protestantism is on the increase. *Education* is moderately attended to, Belgium being a better educated country than either France or Austria. By the last census it appears that nearly half a million children were attending school, or a ninth part of the whole population. Since Belgium was separated from the Netherlands (1830), attendance at school is no longer compulsory; and public instruction is chiefly under the control of the priests. There are now only three universities (Ghent, Liège, and Brussels), fourteen public libraries, containing 500,000 volumes, numerous gymnasia on the German model, and diocesan seminaries in nearly all the large towns. The *National Character* is not homogeneous, owing to the existence of two distinct races, each of which has preserved its own customs, language, and manners from early times. The Flemings, however, greatly resemble the Dutch in cleanliness, perseverance, and laborious industry. The Walloons resemble the French in dress, manners, and vivacity of disposition. Both races are excessively attached to religious shows and ceremonies, which excite surprise by their extreme puerility, and aggravate the pauperism of the country—embracing nearly one-fourth of the entire population.

Literature.—The literature of Belgium is inseparable from that of the Netherlands, the Flemish language and the Dutch having

been till recently the same. The principal authors belonging to the kingdom have written either in Latin or in French, while their native tongues have remained uncultivated, exhibiting only such works as spelling-books, devotional manuals, and the lives of saints. Belgium, indeed, has always been more celebrated for the fine arts than for literature, in which it stands greatly lower than the Netherlands. The Flemish school of painting, founded by Hubert and John Van Eyck, excels in colouring and in the faithful imitation of nature, but does not always exhibit sufficient nobleness of design. It has produced eminent artists in every style; but Rubens, Vandyk, Jordaens, and Teniers are its principal ornaments. The academy at Antwerp, the cradle of this school, was founded in 1510, but there was a society of painters at Antwerp from the year 1442. Other distinguished names belonging to Belgium are Jacob Van Maerland, "father of the poets of the Netherlands;" Philip de Comines, Schott, and Strada, in the department of history; Lipsius, Drusius, and Oudenarde, in philology and criticism; Vesalius and Van Helmont in anatomy and medicine; and Simon Stevin in mathematics, the reputed inventor of decimals. Music is greatly cultivated among all classes of the people, and architecture has been carried to a high degree of perfection, more especially in the Gothic style.

Government and Finance.—The Government is a limited constitutional monarchy, the legislative power being invested in the King, a Senate, and House of Representatives, the last two of which are elected by the people. Liberty of the person and of conscience, freedom of speech and of the press, and trial by jury, are guaranteed by the laws. The origin of the kingdom as a separate State dates only from 1830, previous to which it was united to Holland, and Belgium is consequently the most recently formed independent State in Europe. It successively formed part of the dominions of Austria and Spain from the fifteenth century until 1795, when it was conquered by the French: it was annexed to Holland in 1813, but successfully asserted its independence in 1830. In 1868 the infantry numbered 74,000, the cavalry 7900, artillery 14,513; making a total force of 98,770. The *Navy* is insignificant, but increasing; and recently several powerful steamers have been constructed, which are fitted alike for mercantile and warlike purposes. The *Public Debt*, in 1867, amounted to £28,619,000, being £6 per head; the *Revenue* in the same year amounted to £8,336,000; and the *Expenditure* to £7,742,000.

Commerce.—The *Exports* in 1868 amounted to £48,171,000, and the *Imports* to £54,597,000. The imports comprise various tropical products, as tea, coffee, raw sugar, cotton; tobacco from the United States; wines and fruits from the south of Europe; cotton yarn, cotton cloths, hardware, earthenware, and various manufactured articles from England; and wool from Germany. The principal exports are coal, corn, cattle, woollen fabrics, hempen and linen cloths, flax, hemp, clover-seed, oak-bark, lace, lawn, cambric, car-

pets, cutlery, nails, and refined sugar. Among the principal manufactured articles may be enumerated Brussels carpets, which are unrivalled for elegance; fine lace and thread, made from the finest flax, so valuable that it sometimes fetches £400 sterling per pound; damask table-linen, and other linen cloth, paper, oil-cloth, india-rubber articles, musical instruments, embroidery, ribbons, hats, and various other articles enumerated among the exports. Both as regards exports and imports, its chief customers are France, England, Netherlands, and Germany. The articles sent to England are silk manufactures to the value of nearly £1,000,000, flax, yarn, and dairy produce, amounting, in 1869, to £8,250,000. We send to it, in return, woollen stuffs and machinery, to the value of £8,396,000. At Seraing, near Liège, is one of the most extensive ironworks in Europe, employing 5000 artisans: here are manufactured cannons, firearms, steam machinery, and locomotives.

Inland Communication.—Considering its size, Belgium is better furnished with *Railways* than any other European country.

From Mechlin, as the centre of the entire system, one main line proceeds S.W. by the capital to Mons, and then to France, where it connects with the Great Northern to Paris; a second S.E. to Liège and Cologne; a third N. to Antwerp and Rotterdam; a fourth W. by Ghent and Bruges to Ostend. Another main line connects Antwerp, Ghent, Tournay, and Lille (in France); and the only other we can specify unites Courtrai, Mons, Namur, and Liège. These various lines have been constructed at the expense of the Government, and have powerfully contributed to develop the internal resources of the country. In 1868, the number of miles open for traffic was 1419, yielding a clear revenue of £750,000. The country is also largely intersected by excellent *Canals*, many of which admit merchant vessels. The chief of these are the Bruges and Ghent Canal, which communicates with those of Damme and Ostend at Bruges, and at Ghent with another canal, which proceeds north to the estuary of the East Scheldt; and those which connect the Maas with the Scheldt—amounting together to nearly 300 miles. The two principal rivers, the Maas and Scheldt, are navigable through the whole Belgian territory. The public *Roads* are also numerous, broad, and well paved. Belgium has no **Foreign Possessions**, Holland having retained all the colonies when, in 1830, the two countries were disjoined.

HOLLAND, OR THE NETHERLANDS.

Position and Boundaries.—The Kingdom of the Netherlands is bounded on the N. and W. by the North Sea, S. by Belgium, and E. by Prussia; but the Grand-Duchy of Luxembourg, properly belonging to Germany, lies S.E. of Belgium, between Belgian Luxembourg and the Moselle. Lat. 49° 26′—53° 34′ N.; or, omitting Luxembourg, lat. 50° 46′—53° 34′ N.; lon. 3° 24′—7° 12′ E.

Amsterdam, the capital, situated near the centre, is nearly on the same parallel of latitude as Tralee, Cambridge, Hanover, Berlin, and Warsaw; and on the same meridian as Brussels, Lyon, and Minorca. The form approaches a rhomboid, with deep indentations at the three angles washed by the sea. Length of east side, 187 miles; breadth along the Belgian frontier, 117 miles. The coast-line is extremely irregular, especially in the N., where the sea has made serious encroachments on the land. Length, including the larger indentations, about 500 miles, or 1 mile of coast to each 27 miles of surface.

Area and Population.—Including Limbourg and Luxembourg, the area is 13,631 sq. miles, or nearly twice the size of Wales. Population (in 1868), 3,628,460, being 275 persons to each sq. mile. The western provinces (N. and S. Holland) are the most populous parts of the kingdom, and contain the largest towns; while Drenthe, in the N.E., partly occupied by heath and waste land, is the least populous.

Political Divisions.—Holland is divided into 12 provinces, including the two duchies of Limbourg and Luxembourg.*

North Holland.†—AMSTERDAM 271 (Amstel and Y), Haarlem 31 n., Zaandam or Saardam 12 (Y), Alkmaar 11, Helder 17 (Great Canal), Hoorn 10 (Zuyder Zee).

Towns between 5000 and 10,000 inhabitants.—Nieuwer-Amstel, Enkhuizen.

South Holland.—THE HAGUE 90, Delft 22 (Schie Canal), Leyden 40 (Old Rhine), Schiedam 15, Rotterdam 119, Dort 24 (Maas), Gouda 15 (Rhine, *Yssel branch*).

Brielle, Vlaardingen, Gorkum.

Zeeland.—MIDDLEBURG 16, Flushing 11 (W. Scheldt).

Goes, Zierikzee.

North Brabant.—BOIS-LE-DUC 25 (Dommel), Breda 15 (Merk), Tilburg 18 (Gt. Aa).

Bergen-op-Zoom, Oosterhout.

Utrecht.—UTRECHT 60 (Old Rhine), Amersfoort 14 (Eem).

* The Republic of the Seven United Provinces, so celebrated in history, was formed by the League of Utrecht in 1579, and consisted of Holland, Zeeland, Utrecht, Gelderland, Overyssel, Friesland, and Gröningen; to these were afterwards added, by conquest or treaty, Drenthe and North Brabant, and in 1839 the eastern parts of Limbourg and Luxembourg.

† The following rules will aid the pupil in pronouncing Dutch proper names:—
a, e, i, o, u, are sounded as in German.
aa or *as* = *a* in far; as Haarlem, Alkmaar, also spelled Haerlem, Alkmaer (*Har'lem, Alk-mar'*).
eeu = *u* in rule; as Leeuwarden (*Loo'war-den*).
ie = *i* in me; as Vlieland (*Vlee'land*).
ij or *y* = *ÿ* in my; as Y, Yssel, Dyle, or Ij, Ijssel (*Eye, Issel, Dile*).
oe = *oo* in food; Coevorden (*Koo'vor-den*).
oo = *ō* in bōrne; as Hoorn (*Hōrn*).
ui, uy = *ÿ* in my; Geertruidenberg, Zuyder Zee (*Ger-try'den-berg, Zy'der-Zee*). Others make it = *eu* in German, or *oi* in voice.
d final = *t* in English; as Zeeland (*Tsee'lant*).
ch = *k:* as Utrecht (*Oo'trekt*).
sch = *sk:* Schelt, Schiedam (*Skelt, Skee-dam'*).
th = *t:* Drenthe (*Dren'te*).
s = *ts:* Zwolle (*Tswoll*).

Gelderland.—ARNHEM 31 (Rhine), Nimeguen 24 (Waal), Zutphen 15 (Yssel).
Thiel, Harderwyk, Nykerk.

Overyssel.—ZWOLLE 21 (Zwarte-Water), Kampen 15, Deventer 17 (Yssel).
Raalte, Enschede.

Friesland.—LEEUWARDEN 25, Harlingen 10 (Leeuwarden Canal).
Franeker, Sneek.

Gröningen.—GRÖNINGEN 37 (Hunse).

Drenthe.—ASSEN 5 (Hoorn Diep), Meppel 7 (Reest).

Dutch Limbourg.—MAESTRICHT 28 (Maas).
Venlo, Ruremonde, Weert.

Luxembourg (S.E. of Belgium).—LUXEMBOURG 15 (Alzette, *aff.* Moselle).

Descriptive Notes.—There are only two towns in the Netherlands that contain upwards of 100,000 inhabitants (Amsterdam, Rotterdam); two between 100,000 and 50,000 (The Hague, Utrecht); eleven between 50,000 and 20,000 (Leyden, Gröningen, Arnhem, Haarlem, Maestricht, Leeuwarden, Bois-le-Duc, Dordrecht, Nimeguen, Delft, Zwolle); and twelve between 20,000 and 10,000.

Amsterdam, the capital, and by far the largest city in the kingdom, at the confluence of the Amstel with an arm of the Zuyder Zee, is one of the most important commercial cities in Europe. It is built of bricks, in the form of a crescent, and supported by piles of wood driven into the alluvial soil. In the middle of the thirteenth century it was merely a collection of fishermen's huts, but it now contains 265,000 inhabitants, and is a place of great wealth. Here are vast storehouses filled with the most valuable products of both hemispheres, immense shipbuilding docks, and numerous literary and scientific institutions. It is a great depot for the commodities of the East and West Indies, with which it carries on an extensive trade through the Dutch colonies and its own trading companies. **Haarlem** is the centre of the Dutch trade in bulbous roots and flower-seeds, grown in extensive nursery-grounds in the vicinity; it has numerous manufactures, chiefly cotton and bleaching; and is memorable for the siege it sustained against the Spaniards in 1572. The cathedral of St Bavon contains the largest organ in Europe, and in the market-place stands the statue of Lawrence Coster, a native of the town, and the reputed inventor of the art of printing (1440). **Zaandam**, where Peter the Great, of Russia, wrought as an artisan in the dockyard. **Hoorn**, the birthplace of Tasman, who discovered New Zealand and Tasmania, and of Schouten, who discovered Cape Horn. **Alkmaar**, a fortified town on the Great Canal; near it Camperdown, off which Admiral Duncan defeated the Dutch fleet under De Winter. **Helder**, a strong fortress at the north extremity of the province, commands the principal entrance to the Zuyder Zee. **The Hague**, the usual residence of the King and States-General, may be regarded as the political capital. It is handsomely built, has a rich gallery of Dutch paintings, and is the birthplace of Huyghens the mathematician, and of William III. of England. **Delft**, long famous for its earthenware, the birthplace of the celebrated Hugo Grotius, critic and commentator. **Gouda** is celebrated for its cheese and tobacco-pipes, which are largely exported. **Leyden**, the literary capital, has a celebrated university, founded in 1575, much resorted to by students from other countries, and has the most extensive linen and woollen

manufactures in the country. **Schiedam**, noted for its gin or hollands, which is largely distilled here. **Rotterdam**, the second city of Holland in regard to population, wealth, and commercial importance, is more favourably situated for commerce than Amsterdam: has numerous canals intersecting the city in all directions, and capable of admitting the largest merchant vessels: here are numerous manufactories and distilleries of gin, and more English residents than in any other city in the kingdom: it is the birthplace of Erasmus, the restorer of letters in Western Europe. **Dort**, or **Dodrecht**, was at one time the capital of the Netherlands, and the original residence of the Counts of Holland: here was held the first meeting of the States-General in 1572, which declared the independence of the United Provinces, and the still more famous ecclesiastical synod in 1618, which condemned the doctrines of Arminius. **Middelburg**, near the centre of the island Walcheren, and **Flushing**, or **Vlissingen**, in the south, are strongly fortified seaports, with considerable trade: Flushing has magnificent docks and magazines; was bombarded by the English in 1809; and is the birthplace of Admiral De Ruyter. **Bois-le-Duc**, a fortified city at the junction of the Dommel and Aa, has numerous manufactures of linen, called *holland*. **Breda**, celebrated for the association of nobles formed in 1566, and called "The Compromise of Breda," and for the congress of 1667, has a military academy and arsenal, and is one of the strongest fortresses in the kingdom. **Utrecht**, the oldest city in the kingdom, contains a flourishing university; it is also noted for the "Act of Confederation" of 1579, and for the treaty of peace which terminated the wars of the Spanish Succession in 1713. **Nimeguen**, famous for the treaty of 1678 between France, England, and Holland. **Zutphen**, where the brave Sir Philip Sidney received his death-wound in 1586. **Zwolle**: near it is the convent where the celebrated Thomas-à-Kempis died in 1471. **Leeuwarden** contains the tombs of the Princes of Orange. **Gröningen**, a fortified well-built town, has a university and numerous other literary institutions. **Maestricht** is strongly fortified, and has manufactures of cottons, woollens, and paper. In the neighbouring hill of St Peter's are immense underground stone quarries, twelve leagues in circumference, traversed by about 20,000 passages intersecting in all directions, and forming an intricate labyrinth. In time of war the inhabitants of the surrounding country, with their cattle, find here a secure asylum. **Luxembourg**, capital of the Grand-Duchy of the same name, has a fortress of great strength, which was taken by Louis XIV. in 1684.

Capes and Islands.—Helder Point, the N. extremity of North Holland; the Hook of Holland, W. of South Holland. ISLANDS.—One group at the entrance of the Zuyder Zee, formerly all continuous, and forming a part of the mainland, but now broken up into the islands of Texel, Vlieland, Ter-Schelling, Ameland, Schiermonnikoog, Borkum, and Wieringen; the other in the delta of the Maas and Scheldt, and consisting of Walcheren, N. and S. Beveland, Tholen, Schouwen, all in province Zeeland; and Over-Flakkee, Voorne, Beyerland, and Ysselmonde, in S. Holland.

Seas, Bays, &c.—The Dollart, between Gröningen and Hanover; Lauwer Zee, N.E. of Friesland; Zuyder Zee,* E. of North Holland;

* In Cæsar's time the Zuyder Zee consisted of an inland lake named *Flevo*, and of a tract of country through which a river, 50 miles long, found its way to the

the Y, a branch of the Zuyder Zee, in the S.W. corner; estuaries of the Rhine, Maas, and Scheldt, five in number, in South Holland and Zeeland; Strait of Helder or Mars Diep, between the Helder and Texel.

Surface.—Among the most striking features of this country are its utter want of mountains, the perfectly level aspect of the greater portion of the surface, and the strange unnatural-looking depression of the remainder, which in many places is greatly beneath the level of the sea—thus originating the characteristic name of the country, *Holland*, signifying the "low country." These low portions are in some places protected from the inroads of the ocean by natural barriers of sand-downs, and in others by enormous artificial dykes of earth, faced with stones which have to be imported from other countries. These dykes rank amongst the most stupendous efforts of human industry to be found in any country. The country requires to be protected in a similar manner from the inundations of the rivers, the beds of which are generally above the level of the land.

River-Basins.—There are few distinct river-basins in Holland, as the waters of the Rhine, Maas, and Scheldt, its principal rivers, intermingle at their estuaries, and thus in reality form but one basin. The Vecht and the Hunse are the only other rivers of the kingdom deserving attention. The basins of these five rivers contain ten out of the twelve capitals of provinces, leaving only the Hague and Leeuwarden, which stand on canals that answer all the purposes of rivers.

Table of Rivers and Towns.—The towns of Belgium and the Netherlands given in the following table, in all 112 of 5000 inhabitants and upwards, include 53 above 10,000. These stand on 48 rivers (and canals), of which 12 enter the sea directly, the remainder being their affluents. All the rivers enter the North Sea.

Rivers.	*Towns.*
Hunse,	GRÖNINGEN.
Hoorn-Diep,	ASSEN.
Leeuwarden Canal,	Harlingen, *Franeker*, LEEUWARDEN.
Vecht,	*Enschede.*
Zwarte,	ZWOLLE.
Reest,	*Meppel.*
Rhine*,	Kampen, *Raalte*, Deventer, Zutphen, AMSTERDAM, Leyden, UTRECHT, ARNHEM, Gonda, *Gorkum*, *Thiel*, Nimeguen.
Moselle, *l*	Treves.
Sure, *l*	*Echternach.*
Alzette,	LUXEMBOURG.
Co. Gelderland,	*Harderwyk*, *Nykerk.*
Eem,	Amersfoort.
Amstel or Y,	AMSTERDAM, *N. Amstel*, n., Zaandam, Haarlem.
Zuyder Zee,	Hoorn, *Enkhuizen*, Helder.
Great Canal,	Helder, Alkmaar.
Schie Canal,	THE HAGUE, Delft.
Maas or Meuse*	*Brielle*, *Vlaardingen*,

North Sea; but in 1282 a broad strait was formed (now the Strait of Helder) and the lake converted into a large arm of the sea. The Dollart, formed in 1277, the Bies Bosch in 1421, and Lake of Haarlem, owe their origin to similar inundations, one of which is said to have overwhelmed seventy villages, containing 100,000 inhabitants.

* For the full development of the Rhine, see under "Germany," as only the portion belonging to Holland and Belgium is given here. The Maas and Scheldt are given here in full.

Rivers.	*Towns.*
Maas or Meuse —*continued.*	Schiedam, Rotterdam, Dort, *Gorkum*, *Venlo*, *Ruremonde*, MAESTRICHT, LIEGE, Huy, NAMUR, *Dinant*, *Givet*, Charleville, MEZIERES, Sedan, Verdun, *St Mihiel*.
Merk, *l*	Breda.
Donge, *l*	*Oosterhout*, n.
Dommel, *l*	BOIS-LE-DUC.
Aa,	*Weert*.
Great Aa, *l*	Tilburg.
Niers,	Gladbach, Viersen, Rheidt.
Roer,	*Ruremonde*, Eschweiler, Duren.
Wurm,	Aix-la-Chapelle.
Jaar, *l*	*Tongres*.
Ourthe,	LIEGE.
Vesdre,	Verviers, Eupen.
Sambre, *l*	NAMUR, *Gilly*, Charleroi, *Jumetz*, *Maubeuge*.
Semoy,	ARLON.
Scheldt,	*Goes* n., *Zierikzee* n., *Bergen-op-Zoom*, MIDDELBURG, Flushing, ANTWERP, St Nicholas, *Themsche*, *Dendermonde*, Zele n., *Wetteren*, GHENT, *Oudenarde*, Renaix, Tournay, *Peruwelz* n., *Condé*, *Anzin*,
Scheldt—*continued.*	Valenciennes, Cambrai.
Rupel and Dyle,	*Boom*, Mechlin, Louvain, *Wavre*.
Nethe,	Lierre, *Gheel*.
Little Nethe,	Turnhaut.
Senne, *l*	*Vilvorde*, BRUSSELS, *Hal*, *Waterloo* n., *Soignies*, *Nivelles*.
Demer,	*Diest*, HASSELT.
Geete, *l*	St Trond n., Tirlemont.
Duvine, *l*	*Hamme*, Lockeren.
Dender,	*Dendermonde*, Alost, *Grammont*, *Lessines*, *Ath*, Leuze.
Lys, *l*	Courtrai, Menin, *Werwick*, Tourcoing n., *Commines*, *Warneton*, *Armentières*, Bailleul n., *Merville*, *Aire*.
Mandel, *l*	Thielt, *Meulebeke*, *Ingelmunster*, *Iseghem*, *Roulers*.
Deule,	Roubaix n., LILLE, *Carvin-Epinoy*, *Lens*.
Beurre,	*Hazebrouck*.
Lawe,	*Bethune*.
Scarpe, *l*	Douay, ARRAS.
Haine,	*Pâturages*, MONS, *Binche*.
Selle,	*Solesmes*, *Le Cateau*.
Ostend Canal,	Ostend, BRUGES.
Yser,	*Thourout*.
Yperlee,	Ypres.

Lakes.—None of importance since Lake Haarlem (in North Holland) was drained, except the Bies Bosch in North Brabant, which covers an area of 36 sq. miles. But there are numerous small lakes in Friesland, as Plussen Meer, Slote Meer, Sneeker Meer, and Bergum Meer. Forty small lakes in North Holland, and as many in South Holland, have been drained by means of windmills, the steam-engine not being employed for want of coal. Including Lake Haarlem, 350 sq. miles of admirable pasture-land, called *polders*, have thus been reclaimed.—See under "Seas and Bays."

Climate.—The climate of Holland is raw, damp, cold, foggy, and extremely disagreeable to foreigners. The winds blow incessantly, as if conscious that they have a twofold duty to perform—to carry off the stagnant vapours, and to keep several thousands of windmills in constant operation. It not unfrequently blows a perfect hurricane from the W. or S.W., overwhelming the land with fogs injurious to vegetation, and threatening to overthrow every bulwark which the labours of centuries have erected. The mean annual temperature at Amsterdam is 49°.8; of winter, 35°.6; and of summer, 64°.4. Annual rain, 26 inches; number of rainy days, 170. The winters are severe, the sky being generally overcast, bright days rarely exceeding 40 in the year. Though little snow falls, the frosts are intense; the Zuyder

Zee is frequently frozen over in January, and the Great Helder Canal for three months in the year.

Geology and Minerals.—The rocks consist almost exclusively of tertiary and super-tertiary strata, except in Luxembourg, which is nearly all secondary. Coal is absent, and stones of any size are rarely seen in the soil. Minerals comprise immense deposits of turf: potter's clay, brick-clay, fuller's earth, and a little bog-iron are found, but there are no other minerals. Building-stones are imported from Norway for the erection of piers, and for facings to the immense earthen dykes. The houses are usually built of brick, and of timber from the German forests, which is conveyed down the Rhine in immense rafts, varying from 700 to 1000 feet in length, from 50 to 90 in breadth, and directed by some hundreds of labourers, who construct a village of timber huts on its surface.

Botany, Agriculture, and Zoology.—The botany of the Netherlands is much the same as in other European countries under the same latitude; but, as might have been expected, aquatic plants are more varied and numerous than elsewhere, and though there are no natural forests, plantations of oak, elm, beech, &c., are by no means rare; while the numerous lines of canal are usually lined with rows of willows and poplars. Agriculture forms but a subordinate branch of rural industry, as the country is naturally better adapted for pasturage than for corn crops, the latter being usually quite insufficient for home consumption. The principal grain crops are rye, buckwheat, barley, and oats, together with some wheat in the southern provinces. Horticulture has attained a high degree of perfection, especially at Haarlem, which largely exports flower-roots and seeds. Other important crops are potatoes, flax, hemp, rape-seed, clover-seed, madder, chicory, mustard, hops, beetroot, and tobacco. Live stock and dairy produce are exported very extensively, as also poultry and honey. Zoology: Few wild animals are found except the rabbit and hare, which are largely exported to London; waterfowl and reptiles are very numerous; storks and swans consider this country their home and their paradise; fish of various kinds abound on the coasts—as cod, turbot, sole, and other flat fish; there are extensive herring-fisheries, and numerous whale-ships annually visit the Greenland seas.

Ethnography.—The population of the Netherlands belongs exclusively to the Teutonic stock.

The four prevailing *languages* belong to the German branch of the Teutonic family, and are all closely allied to the German. The chief of these is the *Dutch*, which is the national language, and which is spoken by all classes of society. It is merely a dialect of the *Flemish*, and is spoken in N. Brabant, both languages having been originally the same, but the Dutch proper having been far more carefully cultivated. The *Frisic* spoken by the uneducated classes in Friesland, Heligoland, and parts of Prussia, is more nearly allied to the Hoch Deutsch, or modern German; and lastly, the *German*, spoken in Dutch Luxembourg. About two-thirds of the population are Protestants, and one-third Roman Catholics. The Dutch Reformed Church, by far the most numerous body of Protestants

(1,942,000), is Calvinistic in doctrine and Presbyterian in government; and the other most important denominations are the Lutherans, who amount to 64,000, and Jews 63,000. All forms of religion are freely tolerated, and all denominations placed on a perfect level. Primary education is conducted by the Government, and is generally diffused, there being one-eighth of the population constantly attending school, and nearly every child above ten years of age being able to read and write. The teachers are well paid, the fees are low, and the children of the poor are taught gratuitously. There are three universities—viz., those of Leyden, Utrecht, and Gröningen, the professors of which are paid by the State. The Dutch are proverbial for their cleanliness, frugality, industry, and attention to business; they are also distinguished for their love of freedom, of national independence, and for their courage and nautical skill. Though usually of a dull, phlegmatic temperament, they are charitable to the poor, faithful in all the domestic relations, and highly virtuous. Holland may be called the China of Europe in regard to the industry of the inhabitants, and mendicity is prohibited throughout the kingdom.

Literature.—Ever since the revival of learning in Western Europe, the Dutch have distinguished themselves in almost every department of knowledge, but more especially in philology, criticism, and theology. Of the vast number of learned men to whom the Netherlands have given birth, the following are a few of the most illustrious :—

POETRY: Johannes Secundus or Everard, James van Catz, Vondel, Gaspar, Brandt, William Bilderdyk. PAINTING: John van de Meer, surnamed "The Old," born 1627; another of the same name, styled "The Younger," famous for his pastoral scenes, born 1665; W. and D. Schellings, Limborch, Janssens, Moor. HISTORY: Dousa, Paul Merula, Heinsius, Bondam. JURISPRUDENCE: Vinnen, Leeuwen, Meerman, Grotius. PHYSICAL SCIENCE: John and Zachary Jansen, Huyghens, Almeloveen, Ruysch, Leuwenhoeck, Swammerdam, Sylvius, Boerhaave, Van Swieten, Gaubius, Camper, Van Swinden, Brugmans, S'Gravesande. MENTAL SCIENCE: Spinoza, Helvetius. PHILOLOGY: Heinsius, Golius, Leusden, Schrevelius, Perizonius, Burman, Hemsterhusius, Wetstein, Oudendorp, Valkenaer, Ruhnken, Lennep, Wyttenbach, Tollius, Sluiter. CRITICISM: Erasmus (born 1467), Erpenius, Drusius, Meursius, Gronovius, Clericus, Bos, Hoogeveen, Hugo Grotius. THEOLOGY: Arminius, Gomar, Episcopius, Jansenius, Cocceius, Philip van Limborch, Witsius, Gerard Brandt, Vitringa, Voetius.

History, Government, Finances, &c.—Holland is a constitutional hereditary monarchy. The legislative power is vested in the king and two chambers called the States-General, one of which consists of deputies elected by the people every three years, and the other of members nominated by the Crown for life. The reigning sovereign is William III., who ascended the throne in 1849. From the year 1000 to the end of the eleventh century, Holland was divided into duchies, counties, and imperial cities; was subject to the Counts of Flanders till 1383, and then to the Counts of Burgundy; became part of the empire of Charles V. in 1548; descended to his son Philip, and became an appanage to the crown of Spain; suffered severe religious persecutions in consequence; successfully asserted its independence in 1579, under William, Prince of Orange, and assumed the name of the "Seven United Provinces;" was conquered by the French in

1793, who established the Batavian Republic; was formed into a kingdom by Napoleon I., for his brother Louis, in 1806; became a department of France in 1810; was united to Belgium in 1813, under the name of the Kingdom of the Netherlands, and this arrangement subsisted till 1830, when Belgium became an independent monarchy; and, finally, by the treaty of London (1839), Belgium ceded to Holland the eastern parts of Limbourg and Luxembourg. The European *Army* in 1869 numbered 61,775 men and officers. The *Navy* consists of 67 steamers and 131 other ships, carrying 2000 guns. The *Public Debt*, in 1868, amounted to £81,333,015, being about £21 sterling to each inhabitant; the *Revenue* to £8,305,485; and the *Expenditure* to £8,060,585.

Commerce and Manufactures.—Commerce has ever been the most important element in the prosperity of the Netherlands. At one time it exceeded that of any other European state, and her foreign trade still remains inferior only to that of Great Britain. Her relative position with respect to other States, and her wonderful system of water-communication, have been the main causes leading to this result. In 1868, the exports amounted to £37,434,801 in value; of which £11,390,924 were sent to the United Kingdom, consisting chiefly of butter, cheese, live animals, oilcake, gin or hollands, bulbous roots, flower-seeds, linen, and refined sugar. The imports in the same year amounted to £46,007,000, of which £16,698,000 came from the British Isles, the principal articles being cotton and woollen manufactures. Her other principal exports are the products of her own colonies (as coffee, sugar, raw cotton, spices, tobacco, dried fruits, and tortoise-shell), which she exchanges for the corn, manufactured goods, wool, wines, and brandy of other European countries. Next to Britain her best customers are North Germany, Belgium, France, and Spain. In 1868, the number of vessels that entered and cleared was 8609, carrying 2,039,310 tons. The principal manufactures are linen, paper, woollen and silk cloths, gin, tobacco, snuff, leather, cordage, saltpetre, and tobacco-pipes, together with sugar-refining and shipbuilding.

Inland Communication.—For the most part the railways have been only recently constructed: one between Amsterdam and Haarlem, and thence to Leyden, the Hague, and Rotterdam; and another from Amsterdam to Utrecht, Arnhem, and the German frontier. In 1869, the number of miles open for traffic was 659. The *Canals* are very numerous, and unrivalled in magnificence. They are found along all the great dykes which serve as barriers to the ocean, and have generally an excellent road beside them. The following are only some of the most important:—The Great Canal, between Amsterdam and the Helder, 51 miles long, 125 feet broad, and 24 feet deep, admitting two frigates abreast; the Nieuwer Sluis, between Amsterdam and Utrecht; another from Amsterdam to Haarlem, Leyden, Delft, the Hague, Rotterdam, and Gorkum; and an immense canal from Bois-le-Duc to Maestricht. Passengers are conveyed along these canals at the rate of four miles per hour.

Foreign Possessions.—When Holland was disunited from Belgium (in 1830), the former retained all the colonial possessions, which have an aggregate area of 685,000 sq. m., and a population, in 1868, of 20,728,228. The African possessions consist of various settlements on the Guinea Coast: the Asiatic dependencies comprise parts of Sumatra, Java, Bali, Lombok, Timor, Banda, Amboyna, Moluccas, Celebes, Borneo, Banka, and Rhio; while those in South America embrace the extensive territory of Dutch Guiana, with the islands Curaçoa and St Eustatius. The Dutch also claim possession of the western half of Papua, but they have no settlements on that island.

DENMARK.

Position and Boundaries.—N., the Skager Rack, which separates it from Norway; W., the North Sea; S., Schleswig; E., the Sound and Kattegat, which divide it from Sweden. Lat. 54° 35′—57° 45′ N.; lon. 8° 5′—12° 35′ E. Copenhagen, the capital (lat. 55° 40′), is on the same parallel with Edinburgh, Moscow, Ekaterinburg, Kamtschatka, and Nain in Labrador; while the central meridian passes through Christiania, Kiel, Gotha, Lucca, Elba, and Tunis.

Form and Coast-Line.—The form is extremely irregular, consisting of a part of the Cimbric peninsula and various groups of islands. Extreme length of the mainland, from the Skaw to Ribe, 140 miles; greatest breadth, from Elsinore on the Sound to the Horn in Jütland, 185 miles. The seaboard is very extensive, amounting, if we include the islands, to about 4000 miles, of which 800 miles belong to the mainland, which is greatly indented. The latter gives one mile of seaboard to every four miles of area, a ratio higher than in any country in Europe, save Greece.

Area and Population.—As the result of the late war between Denmark on the one side, and Prussia and Austria on the other, the duchies of Lauenburg and Schleswig-Holstein have been wrested from Denmark, and, by the Treaty of Prague (August 1866), have been incorporated with the Prussian dominions. The area now amounts only to 14,733 sq. miles, or twice the size of Wales; but including Iceland and the Faröe Isles, the whole amounts to 54,935 sq. miles. In 1868, the population was 1,753,787, or 119 persons to the sq. mile; but including Iceland and the Faröe Isles, the population amounted to 1,829,696.

Political Divisions.—Denmark Proper is divided into two provinces—viz., Jütland, or the peninsula, and the Danish Archipelago, between the mainland and Sweden. Iceland lies

700 miles W. of Norway, and 300 miles E. of Greenland; while the Faröe Isles are nearly midway between Iceland and Shetland.

Jütland.*—Aalborg 10 (Lymfiord), Aarhuus 11 (Molle Aa).

Towns between 5000 and 10,000 of population.—Fredericia, Horsens, Randers, Viborg.

Danish Archipelago.—COPENHAGEN 155, Elsinore 8 (E. coast of Zealand), Odense 14 (in the north of Fünen).

Slagelse, Roeskilde, in Zealand; Nyborg, Svendborg, in Fünen; Rönne, in Bornholm.

Iceland.—Reykiavik 1 (S.W. coast).

Faröe Isles.—Thorshaven 1 (S. coast of Strömöe).

Descriptive Notes.—Aalborg (Eeltown), near the mouth of the Lymfiord, deriving its name from the great number of *eels* found in its neighbourhood, has a school of navigation, a soap-manufactory, a herring-fishery, and steam communication with the capital. **Aarhuus** and **Randers,** on the east coast, are small manufacturing towns with considerable trade. **Copenhagen** (Dan. *Kjöbenhavn,* "Merchants' Haven,"), the capital of Denmark since 1441, and the centre of its commerce, is a city of 155,000 inhabitants, elegantly built on the Sound, and strongly fortified; has an arsenal, shipbuilding docks, &c., being the sole station for the navy; a celebrated university, several superb palaces, most of which are now converted into libraries, museums, and picture-galleries, among which may be mentioned the Museum of Northern Antiquities, and the Thorwaldsen Museum: Lord Nelson gained here a great naval victory over the Danish fleet in 1801, and in 1807 it was bombarded, and the Danish fleet taken to England. **Elsinore,** or **Elsineur** (Dan. *Helsingör*), on the Sound, at its narrowest part, and only 3 miles from the Swedish coast, having on the north the strong castle of Kronborg: here were levied, previous to 1857, "the Sound dues" on all foreign merchant-vessels entering or leaving the Baltic, which, in 1851, amounted to nearly 20,000 ships, yielding £154,000 of toll. **Odense,** the principal town in Fünen, has manufactures of woollens and iron wares. **Roeskilde,** the cap. of Denmark till 1441. **Reykiavik,** the capital of Iceland, with only 1200 inhabitants, is the principal town in the island; it is an archbishop's

* The following rules apply to Danish proper names:—

a, e, i, o, u = the same vowels in German and Italian; but *y* = German *ü;* and *w,* which is found only in derivatives from the German, = English *v.*

aa = *ō* in stone, as Aalborg, Aarhuus (*Ōl-borg, Ōr'hoos*).

ä or *ae* = *a* in fate, or German *ä,* as Aeroe, Färoe (*A'ro, Fa'ro*).

ie = *ee* in feet, or German *ie,* as Kiel (*Keel*).

io = English long *ū,* as Kioge, Lymfiord (*Ku'ghee, Lüm-fürth'*)

ei and *ey* = *i* in pine, or *ei* in German, as Eyder, Schlei (*I'der, Schli'*).

ü or *y* = *ü* in German, as Limfiord or Lymfiord (*Lüm-fürth'*).

oe or *ö* = *ö* in German, as Rönne, Tönningen (*Rön'ne, Tön'ning-en*).

uu = *u* in rule, as Aarhuus (*Ör'hoos*).

d between two vowels = *th* in this, or like Spanish *d* in a similar position, as Apenrade (*Ap-en-rā'the*).

g is always hard, but at the end of a word it is sounded very slightly, so as to resemble *h,* as Viborg (*Vee-borh*).

j = *y* in yes, as Jütland (*Yüt'land*).

n when followed by *g* is nasal, as Tönningen (*Tön'ning-en*)

v is usually = *v* in English, but after *a* it has a vowel sound, as Frederikshavn (*Fred-er-iks-haun'*).

see and the seat of a college. **Thorshavn**, the capital of the Farŏe Isles, consists of about 100 wooden huts.

Capes and Islands.—The Skaw, N.E. of Jütland; Horn, W. of Jütland; North Cape in the N.W., and Skagen in the S.W. of Iceland. *Islands.*—Zealand, Fünen, Alsen, Langeland, Aeröe, Laaland, Falster, Moen, bet. Schleswig and Sweden; Bornholm, S. of Sweden; Anholt and Læsöe, in the Kattegat; Iceland, E. of Greenland; Farŏe Isles, bet. Iceland and the Shetland Isles.

Iceland lies 700 miles W. of Norway, 300 E. of Greenland, and immediately S. of the Polar Circle; area, 37,800 square miles; population, 64,690. The surface is mountainous, the highest peaks rising 6000 feet above the sea-level. The whole island is of volcanic origin, and no fewer than thirty volcanoes are enumerated, eight of which have been active within the last hundred years. Of these, Mount Hecla, 5210 feet high, is the most celebrated. There are several boiling springs, one of which, the Great Geyser, throws a column of hot water from 80 to 150 feet high, and at the depth of 72 feet is 30° above the boiling-point. The winters are severe, but the mean annual temperature (40° Fahr.) is higher than in any other country in the same latitude. The island is destitute of trees, and no grain of any kind can be raised; but cabbage and potatoes are cultivated. Fish and birds are the chief support of the inhabitants. The Icelanders belong to the Scandinavian race. Their language, called Norse or Icelandic, is merely old Danish, and is the least-corrupted dialect of the Scandinavian family of tongues. The only commerce of the island consists in the exchange of wool, butter, skins, fish, and oil, for European manufactures. The *Farŏe Isles* consist of a group of twenty-two small islands, lying nearly midway between Iceland and Shetland, of which seventeen are inhabited: area, 510 square miles; population, 8651. They are of trap formation; the coasts are steep and rugged, and the interior mountainous. The winters are very mild; the summer is moist and foggy; longest day, twenty hours—shortest, four hours. Barley is the only grain that can be cultivated. The inhabitants, who are Scandinavians, occupy themselves in fishing, fowling, and tending sheep. Thorshavn, the capital, is a mere village.

Bays, Straits, and Fiords.—Skager Rack, bet. Jütland and Norway; Kattegat, bet. Jütland and Sweden; the Sound, bet. Zealand and Sweden; Great Belt, bet. Zealand and Fünen; Little Belt, bet. Fünen and Schleswig; Lymfiord, Nyssum Fiord, Kingkiŏbing Fiord, in Jütland; Odensee Fiord, in Fünen; Ise Fiord, in Zealand.

Surface.—There are no mountains, or even hills, either on the mainland or in the adjacent islands; the surface is one uniform plain, elevated only a few feet above the sea, with a few eminences rarely exceeding 500 feet, the Himmelsberg alone attaining an elevation of 550 feet. Iceland, however, is highly mountainous; Snäfell, 6862 feet; Oræfajökull, 6426 feet; and Hecla, 5210 feet. The highest summit in the Farŏe Isles attains an elevation of 2864 feet.

Lakes.—These are extremely numerous, but all of them very small: the most important are Mossöe and Fiel, in Jütland; Arve and Tis, in Zealand.

Climate.—The climate is considerably more severe than in the British Isles, though much milder than in Germany, notwithstanding its higher latitude, but very humid and cloudy: storms are rare and of short duration; average rainy days, 137; snowy days, 32; prevailing winds, W. in spring and summer, and S.W. in winter and autumn. Mean annual temperature at Copenhagen, 46° 56′; winter, 31° 31′; and summer, 62° 7′.

Geology and Minerals.—The rock-formations are almost wholly tertiary; but small patches of secondary are found in Jütland, Zealand, and Bornholm; trap-rocks in the Faröe Isles, and trap and volcanic rocks in Iceland, enclosing numerous interesting minerals, as green-earth, galactite, lava, pitchstone, &c. Denmark is peculiarly devoid of minerals: an inferior variety of coal, with blue marble, potter's clay, and building-stone, are met with in Bornholm, but peat is the general fuel throughout the kingdom; and sulphur, green-earth, lava, and basalt are abundant in Iceland.

Botany and Agriculture.—The indigenous vegetation does not differ essentially from that of N. Germany. Forests are not extensive, are mostly confined to the east coast and islands, and usually consist of ash, alder, oak, birch, beech, and fir. In Iceland, forests were formerly numerous, but it is now destitute of trees, except a few stunted birches; its flora is nearly allied to that of Scandinavia, comprising mosses, lichens, and a few shrubs and other flowering plants. According to Vahl and Babington, the number of flowering plants in Iceland amounts to 414 species, of which 282 are dicotyledons. Denmark is pre-eminently an agricultural country; the soil, almost entirely alluvial, is well adapted for cultivation. The numerous marshy districts yield excellent pasturage: rearing of horses and cattle, and dairy produce, form the chief objects of rural industry. More corn is raised than is required for home consumption—the principal crops being rye, barley, oats, wheat, and buckwheat; besides potatoes, hemp, lint, tobacco, and oats. No grain of any kind can be raised in Iceland, but cabbage and potatoes are cultivated; and barley is the only grain that comes to maturity in the Faröe Isles.

Zoology.—Since the decline of the great forests the larger wild animals have disappeared; the wild-boar is sometimes met with, and deer, stags, roes, hares, foxes, martens, polecats, rats, and other small quadrupeds, are abundant. Among *birds* may be mentioned the eider-duck, so famous for its down, the wild-goose, partridge, snipe, and thrush; swans in the Lymfiord; eagles and vultures are rarely seen. *Fishes* comprise the stromming—a small but much-prized species of herring—turbot, torsk, and salmon. Oyster-banks occur on the east coast of Jütland, and seal-fish on the island of Anholt; the cod, salmon, and whale fisheries of Iceland and the Faröe Isles are extensive.

Ethnography.—The Danes, or Normans, belong to the Scandinavian branch of the Teutonic family, and speak Danish, a Scandinavian tongue closely allied to the Icelandic, Swedish, and Faröese. The Icelandic, or Norse, also called the Scandinavian Proper, is merely old Danish, and is the least-corrupted dialect of the Scandinavian family of tongues; but its pronunciation is harsher than the Danish, which is, perhaps, the softest language in Europe—the consonants being pronounced so softly as to be almost imperceptible.

Religion, Education, and National Character.—Christianity became the national religion under Canute the Great, in the beginning of the

eleventh century; the Lutheran forms the established religion, and embraces nine-tenths of the population, but other sects are freely tolerated. Education is widely diffused, attendance at the primary schools being compulsory and gratuitous; and every adult inhabitant can read and write. There are about 20 secondary or higher schools distributed over the kingdom, where fees are paid and where attendance is optional; the sole university now is that of Copenhagen, founded in 1478. The Danes are characterised by a strong, well-built, muscular frame, with regular features, blue eyes, and light hair; not easily roused, but susceptible of strong feelings; of a patient disposition, and requiring much time for deliberation; more remarkable for common-sense than for wit, and highly virtuous.

Literature.—The following list includes only a few of the most eminent literary names in Denmark:—

POETRY: Baron Holberg, the dramatist and historian; Ewald, the famous lyric poet; Falster, Sneedorf, Tullen, Wessel, Oehlenschläger, Baggesen, Hertz. HISTORY: Sueno, Saxo-Grammaticus, Holberg, Suhm, Möllmann, and B. G. Niebuhr. GEOGRAPHY AND TRAVELS: Carsten Niebuhr, and Chevalier Brönstadt. SCIENCE: Tycho Brahe, the eminent astronomer; Oersted, the electrician; Schouw, the botanist; Rask, and J. Olshausen, the philologists; Gruntvig, Petersen, and Rafn, the archæologists; Mynster, Möller, Lindberg, Treschov, Smith, and Twesten, the theologians. PHILOSOPHY AND CRITICISM: Rothe, Rahbek, and Kraft. FINE ARTS: Thorvaldsen, the eminent sculptor; Hausen and Malling, the architects; Tuel, the portrait-painter; Gebauer, the animal-painter; Eckersberg, the historical painter; Dahl, the landscape-painter. ROMANCE: Ingemann, Blicher, Kruse, and Hauch.

Government, &c.—Denmark is a limited constitutional monarchy, the executive power being in the king and his responsible ministers. The *Rigsdag* or Parliament is composed of two houses—the *Landsthing* or Upper House, consisting of 66 members; and the *Folksthing* or House of Commons, containing 101 members; being 1 for every 16,000 of the population. The Revenue for 1869 amounted to £2,926,043; the Expenditure to an almost equal sum; and the Public Debt to £13,238,000. In 1867, the Army consisted of 49,008 men, and the Navy of 31 steamers, 1 frigate, 1 corvette, 1 brig, and 2 ships of the line, carrying in all 312 guns.

Commerce and Manufactures.—The commerce of Denmark is not so extensive as its favourable position would warrant us to expect. There being few good roads in the interior, the coasting trade is very considerable. Its foreign commerce is chiefly with Germany, Britain, Sweden, and Russia. The chief exports are butter, bacon, hams, flour, hides, skins, corn-meal, oilcake, horses, and cattle; while the imports consist of woollens, silks, cottons, salt, iron, hardware, wine, fruit, tea, and articles of colonial produce. In 1867, Denmark exported to Britain produce to the value of £2,588,921, which mainly consisted of oats, barley, oxen, bulls, butter, bacon, flour, hides, oilcake, cattle, and sheep. Of British exports to Denmark, the principal are coal and iron, amounting together to £500,000, and other articles to the value of £700,000. The articles we send to Denmark are those which we can best spare, while those which we

receive from her are what we stand most in need of. There being no coal, and but little water-power in the country, Manufactures are few in number and of limited extent, the metals being all imported. The peasantry manufacture for themselves all the linen and woollen clothing they require, as well as utensils and articles of furniture. Some silk and cotton goods are manufactured in the large towns, and brewing and distilling are extensively prosecuted; while in the capital are several establishments for manufacturing tobacco and porcelain, and for sugar-refining.

Internal Communication.—*Roads* are very inferior, owing to the level and alluvial character of the country. There are three principal *canals*—one connecting the Lymfiord with the North Sea, one in Zealand, and another in Fünen; while the country is largely benefited by the Schleswig Canal, connecting the Eyder with the Baltic. There are several lines of railway now in operation—viz., one from Aalborg, on the Lymfiord, to Randers; a second from Aarhuus to Viborg and the W. coast of Jütland; a third crossing the island Fünen, from Odense to Middelfart; a fourth from Copenhagen to Elsinore; and a fifth from the capital, by Roeskilde, to Korsör on the W. coast of Zealand. In 1867 there were 296 miles of railway in operation.

Foreign Possessions.—Besides Iceland and the Faröe Islands, which have been already noticed, Denmark possesses the extensive region of Greenland, with its thirteen settlements and two mission stations, the principal of which are Frederikshaab, Julianshaab, and Good Hope; Disco Island, west of Greenland; the island St Croix, in the West Indies. The establishments on the Guinea coast were purchased by Britain in 1850; the town of Tranquebar, with its districts on the Coromandel coast, and the town of Serampore in Bengal, were transferred to Britain in 1846; the Nicobar Islands, in the Bay of Bengal, were abandoned in 1848 on account of their insalubrity; while the islands St Thomas and St John, in the Virgin group, West Indies, were sold to the United States in 1867 for the sum of £1,500,000 sterling.

GERMANY.

GERMANY (Germ. *Deutschland;* Fr. *Allemagne*), in its widest acceptation, is an ethnographical, rather than a political, term. It properly denotes that extensive region in the heart of Europe occupied by the German race, which extends from the Baltic and North Sea to the Alps and Adriatic, and from the Rhine and Meuse on the W. to the Niemen and Carpathians on the E. It is of a square compact form, is bounded by the parallels of 44° 46′ and 55° 30′ N., and by the meridians of 6° and 19° W.; has an area of about 280,000 sq. m., and a population

(1868) of about 50,000,000. From the ninth century till 1806, or for a period of 1000 years, Germany formed an empire, governed by a sovereign elected by the different states situated within this wide domain, whose capital was Vienna. Its first and most illustrious sovereign Charlemagne, son of Pepin-le-Bref, king of the Franks, and grandson of Charles Martel, was crowned emperor of the W. in A.D. 800. His dominions extended from the Ebro to the mouth of the Elbe, from the Atlantic to the mountains of Bohemia and the Raab, and from the British Channel to the Volturno. The last emperor was Francis II. of Germany, who renounced that title in 1806, and became Francis I. of Austria. The empire was succeeded by the "Confederation of the Rhine," established at Paris under the protection of Napoleon I., and consisting of the kings of Würtemberg and Bavaria, and several petty sovereigns. In 1815 the Congress of Vienna established "the Germanic Confederation," being an alliance between the thirty-four independent states (then comprehended in Germany), for the purpose of mutual protection and defence. In this Confederation, Austria was the most influential, as its territories embraced nearly a third of the whole extent of Germany, and the emperor of Austria presided over the Federal Diet, or Parliament, which sat permanently at Frankfürt-on-the-Main. Each state had full control over its own internal affairs, but could not declare war, nor establish peace with any other country, without the consent of the Confederation. In 1866, Prussia declared war against Austria; and the contest ended by Prussia expelling Austria from the Confederation, and becoming herself the paramount power in Germany. The states that had aided Austria (Hanover, Nassau, Hesse-Cassel, Hesse-Homburg, Frankfürt) were deprived of their independence, and annexed to the Prussian dominions, which now embrace, in addition, the Duchies of Schleswig-Holstein and Lauenburg, wrested from Denmark, together with portions of Hesse-Darmstadt and Bavaria. The whole of North Germany from the Baltic, Jütland, and the North Sea, to the river Main, embracing 21 semi-independent states, is now formed into a new confederation entitled the "North German Confederation," which is under the control of Prussia; while South Germany — numbering 5 states—forms a loosely-connected group under the nominal ascendancy of Bavaria. The two divisions are, moreover, connected together, to some extent, by treaties of alliance, by which Prussia is virtually placed in command of their armies. They are also united by the commercial bond of the Zollverein, or customs-union, which establishes uniform rates of duty on all German exports and imports. The ancient and powerful

Germanic empire, therefore, after being shivered to pieces, is again in the fair way of being reconstructed.

In consequence of these political changes it will be necessary, in the *first* place, to treat of Prussia and the N. German Confederation in one article; *second*, the states forming Southern Germany; and, *third*, Austria, or the Austro-Hungarian Empire, a large portion of which is embraced within the limits of Germany.

PRUSSIA AND THE NORTH GERMAN CONFEDERATION.

Position and Boundaries.—N., the Baltic, Jütland, and North Sea; W., the Netherlands and Belgium; S., Baden, Bavaria, and Bohemia; E., Russia. Lat. 49° 13′—55° 50′ N.; lon. 5° 52′—23° W.

Berlin, near the centre, is on the same parallel as Cambridge, Amsterdam, Hanover, Warsaw, and Samara; and on the same meridian as Copenhagen, Neu-Strelitz, Trieste, Naples, Malta, and Tripoli. Omitting Prussia Proper, in the extreme east, together with the recently-acquired province of Schleswig-Holstein, in the north, the form approaches that of a rectangular oblong, about 600 miles from E. to W., and 300 miles from N. to S. The coast-line, though extensive, is confined to the northern frontier—850 miles thereof belonging to the Baltic, and 350 miles to the North Sea. For the most part the coast is very low (especially in Pomerania, Hanover, and Oldenburg), and requires to be fenced with dykes, as in the Netherlands, but in Mecklenburg it is considerably bolder. The principal indentations of the Baltic coast are the Gulfs of Danzig and Lubeck, and of the North Sea coast, the estuaries of the Elbe and Weser.

Area and Population.—The united area of the 21 states is estimated at 158,977 sq. m., or nearly a third more than that of the British Isles; while the aggregate population, in 1867, amounted to 29,906,092, being slightly more than the population of the United Kingdom in 1861, and giving 188 persons to each sq. m. The area and population of each of the states forming the Confederation, and in the order of their magnitude, will be found in the following table:—

State.	Area in sq. m.	Population in 1867.
Kingdom of Prussia,	135,904	24,039,543
Kingdom of Saxony,	5,777	2,423,401
Grand-Duchy of Mecklenburg-Schwerin,	5,188	560,678
Grand-Duchy of Oldenburg,	2,428	315,622
Duchy of Brunswick,	1,424	302,792
Grand-Duchy of Saxe-Weimar,	1,403	283,044

State.	Area in sq. m.	Population in 1867.
Grand-Duchy of Mecklenburg-Strelitz,	1,052	98,770
Duchy of Anhalt,	1,026	197,041
Duchy of Saxe-Meiningen,	956	180,335
Duchy of Saxe-Coburg-Gotha,	759	168,735
Duchy of Saxe-Altenburg,	510	141,426
Principality of Lippe-Detmold,	438	111,352
Principality of Waldeck,	433	56,807
Principality of Schwartzburg-Rudolstadt,	374	75,116
Principality of Schwartzburg-Sondershausen,	332	67,533
Principality of Reuss-Schleitz,	320	88,097
Principality of Schaumburg-Lippe,	171	31,186
Principality of Reuss-Greitz,	145	43,889
Free-City of Hamburg,	136	305,196
Free-City of Lubeck,	127	48,538
Free-City of Bremen,	74	109,572
Total, North Germany,	158,977	29,906,092

I. Kingdom of Prussia.—The kingdom of Prussia, in consequence of the recent annexations, now embraces five-sixths of the entire area, and four-fifths of the population, of North Germany. Previous to the late war, the monarchy was divided into the eight provinces of Prussia Proper (East and West Prussia), Posen, Silesia, Pomerania, Brandenburg, Prussian Saxony, Westphalia, and Rhenish Prussia. In consequence of that war, and by the treaty of Prague, held 23d August 1866, Prussia acquired the kingdom of Hanover, Electoral Hesse, the duchy of Nassau, the free city of Frankfürt, together with portions of Bavaria and Hesse-Darmstadt—in all, 27,810 sq. miles, and 4,285,700 of population. The following are now the divisions of Prussia, proceeding from E. to W. :—

Prussia Proper.—Königsberg 106, Insterberg 13 (Pregal), Memel 18, Tilsit 17 (Niemen), Elbing 28 (Elbing), Danzig 90, Graudenz 13, Thorn 16 (Vistula), Braunsberg 10 (Pasarge).

Towns between 5000 *and* 10,000. —Gumbinnen, Marienburg, Marienwerder, Kulm.

Posen.*—Posen 53 (Wartha), Lissa 10 (Obra), Rawitsch 10 (Bartsch), Bromberg 27 (Brahe).

Inowrazlaw, Meseritz, Gnesen, Kempen, Fraustadt, Kratoszyn.

---

* Rules for pronouncing Polish proper names :—

The Vowels are, in general, pronounced as in German; but *é* and *ó*, when accented, are like *a* in fate and *oo* in good; *w* is equal to *v* in English.

The Consonants *b*, *d*, *f*, *h*, *k*, *l*, *m*, *n*, and *p* have the same sounds as in English.

c = *ts*, as Kielce, Bistrica (*Keel'tse*, *Bis-trit'sa*).

ch = *ch* in the Scotch and German, as Bochnia, Chorostkow.

cz = *tsh* or *ch* in church, as Czernowitz, Drohobicz (*Tsher'no-vitz*, *Dro'ho-bitsh*)

g is always hard, as in the German.

Silesia.*—BRESLAU 172, Glogau 18, Brieg 13, Oppeln 11, Ratibor 13 (Oder), Görlitz 31 (Lower Neisse), Hirschberg 10 (Bober), Grünberg 10 (Lunze), Liegnitz 20 (Katzbach), Schweidnitz 16 (Waestritz), Neisse 19, Glatz 12 (Neisse), Gleiwitz 12, Benthem 13 (Klodnitz).

Ohlau, Sagan, Sprottau, Bunzlau, Luben, Jauer, Goldberg, Striegau, Reichenbach, Oels, Strehlin, Münsterberg, Frankenstein, Neustadt, Leobschütz.

Pomerania.—STETTIN 74 (Oder), Stargard 17 (Ihna), Stolpe 14 (Stolpe), Greifswald 18, Stralsund 27 (Str. of Gellen), Köslin 13 (Niesenbecke), Colberg 13 (Persante), Anclam 12 (Peene).

Demmin, Gollnow, Rugenwalde, Neu-Treptow, Greiffenberg.

Brandenburg.—BERLIN 702, Charlottenburg 13, Kottbuss 12 (Spree), Luckenwalde 12 (Nuthe), Brandenburg 26, Potsdam 43, Spandau 16 (Havel), Ruppin 12 (Rhin), Küstrin 10, Frankfürt 41 (Oder), Prenzlow 16 (Ucker), Landsberg 18 (Wartha), Guben 11 (Neisse), Sorau 10 (Bober).

Spremberg, Rathenow, Jüterbok, Perleberg, Wittstock, Schwedt, Wrietzen, Crossen, Königsberg.

---

j = *j* in German, or *y* in English, as Jaslo, Jaworow (*Yas'lo, Ya-vor'ov*).
rz = *zh*, or French *j*, as Brzezany, Przmysl (*Bzha-za'ny, Pzhem'isl*).
sz = *sh* in shall, as Kratoszyn, Zamosz (*Kra-to'shin, Zà'mosh*).

The Polish is spoken in Prussian, Austrian, and Russian Poland, in the more elevated portions of Prussia Proper, and generally in the basins of the Niemen and Vistula. The sounds of the letters in Sclavonian, Bohemian, and Illyrian, correspond, in general, with those of the Polish. The accent in Polish words of more than one syllable is uniformly on the penultimate, and it is the only Sclavonic tongue that contains nasal sounds like the French *en, in, on*, which are represented by the letters *a* and *e*, undermarked with an accent.

* Rules for pronouncing German proper names, with appropriate examples :—

VOWELS.—*a* long, as in far; short, as in fat. *e* long = *a* in fate; short, as in met. *i* long, as *i* in machine. *o* long, as in stone; short, as in yon. *u* long, as in rule; short, as in full.

DIPHTHONGS.—*ä* or *ae* = *a* in fate, as Grätz (*Graits*).
ai, ay, ei, ey = *ey* in eye, as Main or Mayn, Leine, Leyden (*Mine, Lì'neh, Lì'den*).
au = *ou* in hour, as Augsburg, Clausthal (*Ougs'boorg, Clous'tal*).
eu = *oi* in voice, as Reuss, Neuburg, Baireuth (*Roiss, Noi'boorg, Bì'roit*).
ie = *ee* in feet, as Wien, Nienburg, Wiesbaden (*Veen, Neen'boorg, Vees-bah'den*).
ö or *oe* = *eu* in French, or *ao* in Irish : there is no corresponding sound in English—Göttingen, Königsberg, Schönberg.
ü or *ue* = *u* in the French word *bruler:* it has no parallel English sound—*e.g.*, Münden, Nürnberg, Lüneburg.

The CONSONANTS are sounded as in English, with the following exceptions :—
d final = *t* in English, as Detmold, Gmünd, Stuttgard (*Det'molt, Gmünt, Stut'gart*).
c before *e, i, y* = *ts*, as Celle (*Tsel'leh*).
ch = Scotch *ch* or Irish *gh* in Loch Ness, Lough Foyle, but before *s radical* = *k*; as Eisenach, München, Sachsen (*I'zen-ach, Mün'chen, Sak'sen*).
g is hard before *e, i, y*, as Giessen, Meiningen (*Ghees'sen, Mi'ning-en*).
h is pronounced only at the beginning of a word or of a radical syllable; when after a vowel, it lengthens the vowel, as Hanover, Jahde (*Han'o-ver, Yà'deh*).
j = *y* in yes, as Jena, Jaxt (*Ye'na, Yaxt*).
s between two vowels has the sound of *z*; but elsewhere it is always sharp, as Eisenach, Osnaburg (*I'zen-ach, Os-na-boorg*).
ss and *sz* = *s* in this, as Cassel, Giessen (*Cas'sel, Ghees'sen*).
sch = *sh* in shine, or *ch* in French and Portuguese, as Schleitz, Schwartzburg (*Shlites, Schwarts'boorg*).
th = *t*, as Gotha, Clausthal (*Go'ta, Clous'tal*).
v between two vowels is equal to *v* in English; elsewhere it is equal to *f* in life, as Hanover, Vogelberg (*Han'o-ver, Fo'ghel-berg*).
w is nearly equal to English *v*, as Waldeck, Wismar (*Val'deck, Vis'mar*).
z and *tz* = *ts*, as Zellerbach, Wartzburg (*Tsel'ler-bach, Varts'boorg*).

Prussian Saxony.—MAGDEBURG 79, Wittenberg 13, Torgau 12 (Elbe), Burg 15 (Ihle), Halle 49, Merseburg 13, Weissenfels 14, Naumburg 15 (Saale), Quedlinburg 16 (Bode), Halberstadt 25 (Holzemme), Aschersleben 15 (Eine), Eisleben 12 (Böse), Zeitz 14 (White Elster), Mühlhausen 17 (Unstruth), Nordhausen 20 (Zorge), Erfürt 42 (Gera), Eilenburg 10 (Mulde).

Schönebek, Barby, Gardelegen, Haldensleben, Kalbe, Langensaltza, Sangerhausen, Heiligenstadt, Suhl.

Hanover.—HANOVER 74, Göttingen 13 (Leine), Hildesheim 13 (Innerste), Celle or Zell 15 (Aller), Clausthal 10 (Zellerbach), Lüneburg 16 (Ilmenau), Emden 12 (Emden canal), Osnabrück 18 (Hase), Harburg 13 (Elbe).

Eimbeck, Osterode, Verden, Goslar, Nienburg, Hameln, Münden, Stade, Norden, Leer, Aurich.

Schleswig-Holstein and Lauenburg.—GLUCKSTADT 5, Altona 67 (Elbe), Kiel 24 (Kiel Fd.), Schleswig 11 (Schlei Fd.), Flensburg 22 (Flensburg Fd.)

Rendsburg, Itzehöe, Elmshorn, Preetz, Hadersleben.

Hessen Cassel and Homburg.—CASSEL 41, Fulda 10 (Fulda), Hanan 17 (Main).

Homburg, Hersfeld, Eschwege, Schmalkalden, Marburg.

Nassau, Frankfürt, and Hohenzollern.—WIESBADEN 30 (Salzbach), Frankfürt 78 (Main).

Hechingen, Ems.

Westphalia.—MÜNSTER 28 (Ahe), Minden 18 (Weser), Herford 11, Bielefeld 17 (Werre), Paderborn 12 (Lippe), Söst 11 (Sösterbach), Dortmund 33 (Emster), Iserlohn 15 (Baarenbach), Bochum 11 n. (Ruhr).

Hamm, Lippstadt, Arnsberg, Witten.

Rhenish Prussia.—COLOGNE 125, Wessel 18, Crefeld 54 n., Düsseldorf 63, Neuss 11 n., Solingen 12 n., Bonn 24, Coblentz 27 (Rhine), Duisburg 14, Mülheim 14, Essen 32 (Ruhr), Remscheid 18 n., Elberfeld 65, Barmen 65 (Wipper), Treves 22 (Moselle), Aix-la-Chapelle 68 (Würm), Eupen 14 (Vesdre), Gladbach 19, Viersen 15, Rheids 12 (Niers), Eschweiler 14, Duren 10 (Roer), Saarbrüch 13 (Saar), Kreuznach 12 (Nahe).

Emmerich, Cleves, Mühlheim, Neuwied, Rendsdorf, Lennep, Mayen, Saar-Louis.

Descriptive Notes.—The Prussian monarchy, as now extended, contains four cities of upwards of 100,000 inhabitants (Berlin, Breslau, Cologne, Königsberg): twelve between 100,000 and 50,000 (Danzig, Magdeburg, Frankfürt, Hanover, Stettin, Aix-la-Chapelle, Altona, Elberfeld, Barmen, Düsseldorf, Crefeld, Posen); twenty-four between 50,000 and 20,000 (Halle, Potsdam, Erfürt, Cassel, Frankfürt-on-Oder, Essen, Görlitz, Dortmund, Wiesbaden, Elbing, Stralsund, Coblenz, Bromberg, Duisburg, Brandenburg, Münster, Halberstadt, Kiel, Bonn, Gladbach, Flensburg, Treves, Nordhausen, Liegnitz); and eighty between 20,000 and 10,000.

Königsberg, capital of Prussia Proper, a populous and strongly-fortified city on the Pregel, near its mouth in the Frische Haff; it is the fourth city in Prussia in point of population; has shipbuilding docks, great trade in grain, numerous manufactures, chiefly woollens, cottons, linens, and silks, and a famous university; amongst its more illustrious professors may be mentioned Immanuel Kant, the famous metaphysician,

Olshausen, Von Bohlen, Gebser, Dinter, Lobeck, and Graff; its observatory has been rendered celebrated by the labours of the astronomer Bessel. **Memel,** the most northern town in the kingdom, at the entrance of the Curische Haff, strongly fortified, and with extensive trade in timber and corn. **Tilsit,** on the Niemen, memorable for the treaty between France, Russia, and Prussia in 1807, which deprived Prussia of all her possessions between the Rhine and the Elbe, and the greater part of Prussian Poland; nearly all of which were restored by the Congress of Vienna in 1815. **Elbing,** a fortified flourishing town, with considerable trade and manufactures. **Danzig,** a large fortified city near the mouth of the Vistula, one of the greatest corn-shipping ports in the world; great foreign commerce; the birthplace of Fahrenheit, the inventor of the mercurial thermometer. **Thorn,** a strongly-fortified town on the Vistula; the birthplace of Copernicus, the eminent astronomer, in 1473. **Posen,** a large fortified city on the Wartha, was at one time the capital of Poland; it is largely engaged in the export of agricultural produce. **Rawitsch** and **Bromberg** possess several manufactures, and an active transit trade: the Canal of Bromberg connects the Vistula with the Netze, an affluent of the Oder. **Breslau,** the second city in Prussia in point of population; the great emporium for the linens of Silesia; a great wool-market; numerous manufactures; trade in mining produce, Hungarian wines, and other merchandise; the birthplace of Wolff, the mathematician and philosopher; has a university adorned by the names of Von Cölln, David Schulz, Bernstein, Middledorpf, Wachler the historian, Schleiermacher the theologian, and Passow the lexicographer. **Glogau,** a strongly-fortified town on the Oder, with several manufactures, especially of sugar from beetroot. **Görlitz** has a Protestant college, and extensive manufactures of linen and woollen cloths. **Liegnitz:** here the Prussians, under Frederick the Great, totally defeated the Austrians in 1760. **Neisse,** a fortified town on a river of same name, has various printing establishments, and manufactures of linen and woollen cloths. **Stettin,** a populous and fortified city at the mouth of the Oder, and, next to Danzig, the chief seaport of the kingdom, with shipbuilding, and numerous manufactures, the chief of which is woollen. **Greifswald,** a fortified town, with a university. **Stralsund,** on the Baltic, a strongly-fortified seaport, with considerable trade. **Berlin,** the capital of the province Brandenburg and of the kingdom, is an elegant city, situated on the Spree, an affluent of the Havel, and containing 700,000 inhabitants; famous for the variety and extent of its manufactures, among which the most remarkable are its beautiful cast-iron articles called "Berlin jewellery," its paper, porcelain, and dye-works. There are numerous educational establishments, including the university, the most celebrated in Germany, though only founded in 1810: it is usually attended by about 1800 students; and among its professors are many of the most illustrious names in modern literature—as Neander, the celebrated church historian; Schleiermacher, Hengstenberg, Strauss, the neologist; De Wette, Marheinecke; Von Savigny, the jurist; Hegel, the metaphysician; Encke, the astronomer; Von Raumer, the historian; Karl Ritter, the prince of geographers; Bekker, the indefatigable editor of Greek and Roman classics; Böckh, the Greek philologist; Zumpt, the Latin grammarian; and Bopp, the renowned Orientalist, and author of the 'Comparative Grammar of the Indo-European Languages:' the royal library contains 600,000 printed volumes. Berlin is indeed the great centre of intellectual development in the north of Germany. **Potsdam** is, next to Berlin, the handsomest city in Prussia, the second royal residence in the kingdom,

the burial-place of Frederick the Great, and the birthplace of Alexander von Humboldt, the illustrious author of the 'Kosmos.' **Frankfürt** on Oder has extensive commerce in German and foreign produce, and is the seat of three great annual fairs, attended by merchants from all parts of Europe. **Magdeburg**, an ancient and populous city, and the strongest fortress in the kingdom, has great trade, which is facilitated by numerous steamers on the Elbe. **Wittenberg**: here the Reformation commenced in 1517, and here are buried its great promoters, Luther and Melancthon. **Halle**, with a celebrated university adorned by the names of Gesenius, Tholuck, Ullman, Rödiger, Spener, Thomasius, Breithaupt, the brothers Michaelis, Cellarius, Baumgarten, Semler, Knapp, Wegscheider, and Meckel: Halle is also the birthplace of Handel the musician. **Merseburg**, and **Naumburg** the birthplace of Richard Lepsius, both on the Saale, are thriving industrious towns. **Quedlinburg**, the birthplace of Klopstock and of Karl Ritter. **Halberstadt** contains a superb cathedral and a Jewish synagogue. **Eisleben**, birthplace of Luther, 1483. **Zeitz**: rich copper-mines in the vicinity. **Muhlhausen** and **Nordhausen**, fortified towns, with manufactures of carpets, coarse linens, and woollens. **Erfurt**, with woollen and linen manufactures: its university (founded in 1378), where Luther was educated, and at one time the most celebrated in Germany, was suppressed in 1816, while the monastery of St Augustine, containing the Reformer's cell, is now an orphan asylum. **Hanover**, formerly cap. of kingdom of same name, is a well-built, trading, and manufacturing city, on the Leine, and the birthplace of the illustrious astronomer, Sir W. Herschel. **Göttingen**, the seat of a famous university. **Clausthal**, capital of the mining district of the Harz, with valuable lead and silver mines. **Luneburg**, a flourishing manufacturing town, with salt-pits and saline springs in the vicinity. **Emden**, the most commercial town in Hanover, with shipbuilding docks. **Osnabruck** is noted for the manufacture of coarse linens called *osnaburgs*. **Glcükstadt**, formerly cap. of the duchy of Holstein. **Altona**, an important trading and commercial city on the Elbe, opposite Hamburg, with shipbuilding docks, various manufactures, and an observatory. **Kiel**, at the eastern extremity of the Schleswig-Holstein Canal, is an important trading town, and the seat of a university. **Flensburg**, in the district Angeln, inhabited anciently by the Angles, who, along with the Jutes and Saxons, invaded Britain in A.D. 449, and gave England its present name. **Cassel**, formerly the cap. of the Electorate of same name, and **Hanau**, are thriving manufacturing towns. **Schmalkalden**, where the celebrated league was formed, in 1530, between the Protestant princes of Germany. **Wiesbaden**, formerly cap. of the duchy of same name, is one of the principal watering-places of Germany. **Frankfürt**, formerly a free city, and the seat of the Germanic Diet, is a populous commercial city on the Main, now chiefly noted for its extensive banking transactions: is the birthplace of Göthe, in 1749. **Münster**: here was concluded the Peace of Westphalia in 1648, which established the present system of European States, and secured religious liberty to the Protestants; and here John of Leyden, with his two accomplices, were suspended in iron cages in 1535. **Minden**: here Frederick of Brunswick defeated the French in 1759. **Dortmünd**, the seat of a mining board. **Iserlohn**, noted for its hardware goods. **Cologne**, with 125,000 inhabitants, is the third city in Prussia in point of population, and by far the most important in the western division of the kingdom: its position on the Rhine gives it great commercial facilities; famous for its distilled waters, called "Eau-de-Cologne," and for its magnificent Gothic cathedral, one of the finest

in Europe: here the monk Barthold Schwarz invented gunpowder in 1330; and here was born Rubens, the most famous painter of the Flemish school, in 1577. **Crefeld**, the principal town in Prussia for the manufacture of silk goods. **Dusseldorf**, a large commercial city, has a bridge of boats across the Rhine. **Bonn** has a celebrated university adorned by the names of Niebuhr, A. W. von Schlegel, Welcker, Freytag, Augusti, Nitsch, Bleek, and Gieseler: it is the birthplace of Beethoven the composer. **Coblentz**, at the confluence of the Rhine and Moselle, the former of which is crossed here by a bridge of boats, 485 yards long, has manufactures of cotton and woollen fabrics: on the opposite bank of the Rhine is the formidable fortress of Ehrenbreitstein. **Elberfeld** and **Barmen**, great seats of the cotton, silk, and thread manufacture, and famous for dyeing Turkey red. **Treves** (*Ger.* Trier), at one time the residence of Constantine the Great, is believed to be the oldest city in Germany: it contains numerous Roman remains, and maintains a brisk trade in corn, timber, and Moselle wines: here is exhibited a coat which the monks assert is "the seamless coat of the Saviour." **Aix-la-Chapelle** (*Ger.* Aachen), the residence and burial-place of Charlemagne; celebrated for its mineral baths, its treaties of 1668 and 1748, and the congress of 1818: here were crowned the emperors of Germany from 814 till 1531.

II. Saxony and the Smaller States.

Saxony.—Dresden 156, Meissen 10 (Elbe), Bautzen 12 (Spree), Leipzig 91, Plauen 21 (White Elster), Crimmitzchau 12, Werdau 10 (Pleisse), Reichenbach 11 (Goltsch), Eilenburg 10, Glauchau 19, Meerane 16 n., Zwickau 25 (Mulde), Freiberg 21 (Münzbach), Chemnitz 59, Annaberg 10 (Chemnitz), Zittau 14 (Mandau).
Oschatz, Pirna, Grimma, Lössnitz, Schneeberg, Dobeln, Rosswein, Nossen, Mittweida, Hainicken, Frankenberg, Zschoppau, Grossenhain.

Mecklenburg-Schwerin.—Schwerin 25 (L. Schwerin), Rostock 29 (Warnow), Güstrow 11 (Nebal), Wismar 13 (N. coast).
Grabow, Ludwigslust, Parchim.

Oldenburg.—Oldenburg 12 (Hunte), Berne 8 (Berne).

Brunswick.—Brunswick 51, Wolfenbüttel 10 (Ocker).
Helmstadt.

Saxe-Weimar.—Weimar 14 (Ilm), Eisenach 12 (Hörsel).
Jena.

Mecklenburg-Strelitz.—Neu-Strelitz 7 n. (Havel).

Anhalt.—Dessau 16 (Mulde), Bernburg 12 (Saale), Zerbst 11 (Nathe), Köthen 12 (Ziethe).

Saxe-Meiningen.—Meiningen 7, Hildburghausen 5 (Werra).

Saxe-Coburg-Gotha.—Gotha 18 (Leine), Coburg 11 (Itz).

Saxe-Altenburg.—Altenburg 18 (Pleisse).
Schmöllin, Ronneburg.

Lippe-Detmold.—Detmold 6 (Werra).

Waldeck.—Arolsen 2 (Aar).

Schwartzburg-Rudolstadt.—Rudolstadt 6 (Saale).

Schwartzburg-Sondershausen.—Sondershausen 6 (Wipper).
Arnstadt.

Reuss-Schleitz.—Gera 15 (White Elster).

Schaumburg-Lippe.—Bückeburg 4 (Aue).

Reuss-Greitz.—Greitz 11 (White Elster).

Free Cities. — Hamburg 225 (Elbe), Lübeck 37 (Trave), Bremen 75 (Weser).

Descriptive Notes.—In the twenty smaller states of the Confederation there are two cities containing upwards of 100,000 inhabitants (Hamburg, Dresden); four between 100,000 and 50,000 (Leipzig, Bremen, Chemnitz, Brunswick); five between 50,000 and 20,000 (Rostock, Schwerin, Zwickau, Freiberg, Plauen); and twenty-five between 20,000 and 10,000.

Dresden, cap. of the kingdom of Saxony, and the fourth largest city in North Germany, is renowned for its fine edifices, gallery of paintings, magnificent bridge across the Elbe (1424 ft. long), and extensive manufactures, especially of china and porcelain ware, of great beauty. **Meissen:** here is manufactured the famous Dresden china. **Bautzen,** where Napoleon I. defeated the Russians and Prussians in 1813. **Leipzig,** the great emporium of the German book trade, is one of the most important commercial towns in Germany, the seat of three great annual fairs, attended by merchants from all parts of Europe and Western Asia, and the seat of a celebrated university. **Plauen** has extensive linen and cotton manufactures. **Freiberg,** chief town of the mining district of Saxony, has a museum of geology, containing 100,000 specimens, bequeathed by Werner. **Chemnitz,** celebrated for its cotton hosiery, is the most important manufacturing town in Saxony. **Schwerin,** the residence of the Grand Duke of M. Schwerin, is an ancient town on the W. side of the lake of same name. **Rostock,** a seaport town with a small university. **Oldenburg,** cap. of grand duchy of same name, is well fortified, river-port, with 12,000 inhabitants. **Brunswick,** cap. of duchy of same name, a populous city, largely engaged in the woollen trade: here the spinning-wheel was invented. George I., Elector of Hanover, and Duke of Brunswick, became King of Great Britain in 1714. **Weimar,** cap. of grand duchy, is a small town on the Ilm, noted for having been the residence of Göthe, Schiller, Herder, Wieland, and other men of genius. **Eisenach:** near it the castle of Wartburg, the Patmos of Luther in 1522. **Neu-Strelitz,** cap. of grand duchy, contains a collection of curious antiquities. **Dessau,** a neat little town, near the confluence of the Mulde and Elbe, contains a college and a normal school. **Meiningen,** cap. of duchy, a small town, with a fine collection of paintings. **Gotha,** a beautiful town on the Leine, and cap. of duchy, with manufactures of cotton, woollen, and porcelain, a picture-gallery, and a library of 120,000 vols. Since 1764, the 'Almanach de Gotha' has been published here. **Coburg;** near it Rosenau, the birthplace of the late lamented Prince Albert. **Altenburg,** cap. of duchy, is a thriving town with manufactures of ribbons and woollen cloths. **Detmold,** cap. of principality, is a small town on the Werra, of no special interest. **Hamburg,** a celebrated free city on the estuary of the Elbe, with 225,000 inhabitants: it is said to have been founded about A.D. 809 by Charlemagne; it is the most important commercial city on the continent, and the great entrepôt for British and American goods to Germany: its mercantile navy consists of about 500 vessels, carrying 240,000 tons; the imports in 1867 amounted to £68,000,000. **Lubeck,** also a free city, has great fairs, and a very extensive commerce with Denmark, Sweden, and Russia: here are kept the records of the Hanseatic League, so famous in the middle ages. **Bremen,** a free city on the Weser, and second only to Hamburg as a seat of German commerce, is

the great port for emigration to America; in 1867 the exports and imports amounted to about £15,000,000 each.

Capes and Islands.—Bruster Head and Rixhöft Point, guarding the G. of Danzig; C. Dars, N.W. of Pomerania; Ritzebüttel Head, in Hanover. ISLANDS.—Usedom and Wollin, at the mouth of the Oder; Rügen, N.W. of Pomerania; Fehmern and Alsen, E. of Schleswig-Holstein; Sylt, Föhr, and Römö, W. of Schleswig; and a small archipelago between the mouths of the Weser and Ems.

Gulfs, Bays, and Straits.—Curische Haff, at the mouth of the Niemen; Frische Haff and G. of Dantzic, at the mouth of the Vistula; Swinemünde Bay and Stettiner Haff, N. of Pomerania; West Deep and Str. of Gellen, between Rugen and the mainland; G. of Lübeck, at the mouth of the Trave; Fehmern Sd. and Kiel Fd., N.E. of Holstein; Flensborg Fd. and G. of Apenrade, E. of Schleswig; Estuaries of the Elbe, Weser, Jahde, and Ems.

Surface and Mountains.—The surface of the numerous countries forming the North German Confederation is, generally speaking, extremely level, Prussia and the Northern States being situated in the great northern plain of Central and Eastern Europe; but the southern members of the confederation are bounded, or traversed, by various chains of hills, as the *Sudetic* range and the *Riesengebirge*, between Prussia and Bohemia; the *Thüringerwald* in the Sachsen States; the *Odenwald* in Hesse Darmstadt; the *Westerwald* in Nassau; the *Eifel* in Rhenish Prussia; and the *Harz* in Brunswick and Hanover, for which see under "South Germany."

River-Basins.—Beginning at the N.E. angle of Prussia, the principal river-basins of North Germany are the Niemen or Memel, with an area of 35,700 English sq. miles; the Vistula, 72,300 sq. miles; the Oder, 45,200 sq. miles; the Elbe, 55,000 sq. miles; the Weser, 17,700 sq. miles; and the Rhine, 75,000 sq. miles. Of these the first three fall into the Baltic, and the others into the North Sea. An extended table of the rivers and towns for the whole of Germany will be found under "Austria."

Lakes.—The lakes of North Germany are exceedingly numerous, but are all very small, the principal being the Spirden See and Mauer See, in Prussia Proper, the former being drained by an affluent of the Pregel, and the latter by the Pissek, a sub-affluent of the Vistula; Plau, Malchow, Flesen, Kölpin, and Müritz, in Mecklenburg, all drained by the Elde, a tributary of the Elbe; Dümer, in Hanover, drained by the Hunte, an affluent of the Weser.

Climate.—Prussia and the other States of North Germany being all situated in the great northern plain, and therefore exposed to the winds blowing from the Baltic, the North Sea, and the Arctic Ocean, the winter is long and severe, the lakes and rivers being covered with thick ice—sufficient to bear loaded waggons—and the ground with deep snow, for three or four months in the year; but the summer is usually warm, humid, and variable, and in Rhenish Prussia the vine is successfully cultivated. The mean annual tem-

perature of Berlin, which is one degree farther north than London, is 48°.3, or three degrees lower than in London; the mean summer at Berlin is nearly the same as in the British metropolis (64°.2), but the mean winter is more than 3½ degrees lower. The annual rainfall at Berlin is about 22⅓ inches, decreasing towards the east; number of rainy days 152; prevailing winds W. and S.W.

Geology and Minerals.—The Rhenish provinces of Prussia consist, for the most part, of upper palæozoic beds, but nearly all the rest of Northern Germany is covered with tertiary strata. Minerals are very abundant, especially in the Erzgebirge and Harz Mountains; the former containing the metals in great variety, besides numerous precious stones, and the latter, mines of gold, silver, iron, copper, lead, salt, coal, alum, and sulphur. Valuable mines of coal and zinc are wrought in Silesia; coal, iron, lead, copper, and mineral springs abound in the Rhenish provinces; while recently have been discovered inexhaustible deposits of pure rock-salt in Pomerania, near Stettin, whence it can be shipped at a very low price. The most characteristic mineral of Prussia proper is amber, a fossil resin, which occurs in beds of lignite on the Baltic coast, and which is exported to Turkey and other places, to be manufactured into mouthpieces for meerschaum pipes. Prussia has upwards of 100 mineral springs of various properties and virtues, the most noted of which are those of Aix-la-Chapelle, Wiesbaden, Ems, Selters, and Homburg.

Botany and Agriculture.—The whole of Germany is embraced in Professor Schouw's second "phyto-geographic region," the characteristics of which are mentioned under "Europe." The indigenous plants are reckoned at about 7000 species, of which 2566 are flowering, including 2037 dicotyledons and 529 monocotyledons. Forests and heaths are numerous, and the most frequent forest-trees are the elm, poplar, oak, birch, and pine. Fruit-trees form of late years an important article of husbandry, and the vine, chestnut, and almond thrive well in the valley of the Rhine; while the apple, pear, walnut, and apricot abound everywhere. Of all wine-producing countries, no vineyards are cultivated with such care as those of Rhenish Prussia, Nassau, and Rhenish Bavaria. There is a universal interest taken in the growth of the vines, and a universal pleasure in their progress. The district which produces the best Rhenish wine is the Rheingau, a chain of hills in Nassau, extending along the right bank of the Rhine for about 25 miles. The wines of Germany are popularly known in this country under the general name of *Hock*, but there are numerous varieties, the chief feature of all being their delicate flavour and extraordinary durability. Within the last ten years the importation of Rhenish wine into this country has nearly doubled itself. Rye is the favourite grain, and forms, with potatoes, the principal food of the people; but wheat, barley, oats, flax, hemp, and tobacco are extensively cultivated. Chicory and beetroot (for the manufacture of sugar) are cultivated largely in Saxony. The soil is, generally speaking, fertile, and the various operations of agriculture are carefully conducted. About three-fourths of the

population are engaged on the soil, and more corn is raised than is required for home consumption. Pasturage is generally excellent; sheep, cattle, and horses are extensively reared; and wool forms an important article of exportation. The merino breed of sheep has been introduced into Saxony with great success.

Zoology.—The number of species of Mammalia in the whole of Germany is estimated at 78, of which 46 are carnivora, 22 rodents, 1 pachyderm, and 9 ruminants. The forests abound with wild animals, the most common of which are the hog, deer, wolf, fox, lynx, marten, and weasel. The birds amount to 305 species, the reptiles to 31, and fishes are numerous, both marine and fresh-water. Of the former, the salmon, sturgeon, turbot, and flounder are the most common; and of the latter, the carp, pike, perch, eel, and trout. The Fishes, Molluscs, Radiata, and most of the Articulata, belong to the Celtic province of marine life, which includes the Baltic and North Sea. Among domestic animals may be mentioned horses, cattle, and sheep, all of improved breeds; asses, mules, goats, and swine in immense numbers; while the silkworm has recently made great progress in many of the states.

Ethnography.—The people of North Germany belong, for the most part, to the Teutonic stock, but the Sclavonians predominate in Posen, Prussia Proper, and a part of Upper Silesia, and there is a mixture of Sclavonic blood in Mecklenburg, Saxony, and the portion of Bavaria south of the Danube; while Celtic blood has mingled with the Teutonic in Würtemberg, Baden, and parts of Bavaria.

Language.—The German language, in one or other of its dialects, is almost the only tongue spoken in Northern and Southern Germany. It branches off into two grand divisions—the *Hoch Deutsch* or High German, distinguished by its rough and guttural sounds; and the *Nieder Deutsch* or Low German, characterised by a softer enunciation. The former prevails in Southern and Central Germany—viz., Baden, Würtemberg, Bavaria, Nassau, the Saxon and Hessen States; and the latter in Prussian Germany, Oldenburg, and Mecklenburg. High German alone has been cultivated since the time of Luther, whose mother tongue it was, and who made it the vehicle of spreading the principles of the Reformation. In all parts of Germany it is the medium of intercourse between the educated classes; it is also the language of religion, legislation, and literature. Various Sclavonic tongues are also spoken, as the Polish in Posen, the Slowakish in Upper Silesia, and the Wendish in the centre of Pomerania. The Old Prussian once spoken by the *Pruszi* in Prussia Proper—a Sclavonian tongue allied to the Lithuanian—is now extinct.

Religion.—Throughout the various states of Northern Germany the great majority of the inhabitants are Protestant, there being in 1867, in the 21 states, 21,314,000 Protestants and 8,131,000 Roman Catholics, together with 350,000 Jews, who principally reside in Posen. In Prussia alone the Protestants number 15,672,000, and the Roman Catholics 7,955,000. The Protestants are divided into Lutherans and Calvinists, the former of which are greatly the more numerous; but Lutheranism has lost all its original earnestness, and now occupies a sort of middle position between Calvinism and Catholicism: for example, it retains private confession, bestows on the penitent full absolution from guilt,

and Luther's cardinal doctrine of "justification by faith alone" has now come to signify justification by *faith in the sacraments*. Properly speaking, there is no Established Church, and one religion is not upheld by the State in preference to another; all denominations enjoy the same privileges, all citizens are equally eligible to places of trust and emolument, and both the Roman Catholic and Protestant clergy are paid by Government.

Education.—Both primary and advanced education is in a highly flourishing condition throughout the whole of North Germany, unless we except Oldenburg and the two Mecklenburgs, where primary education is deficient. In all the other states, especially in Prussia and Saxony, the people are better educated than in any other country in Europe. Generally speaking, one-sixth of the population are constantly at school, attendance at which is compulsory between the ages of six and fourteen years. In Prussia, where education absorbs 2½ per cent of the public revenue, all schools, whether public or private, are under the control of the Minister of Public Instruction. School-fees are exceedingly moderate, the children of the poor are instructed at the public expense, and it is rare to meet with any one who cannot read and write. In addition to the primary schools, there are numerous gymnasia, lyceums, academies, universities, learned societies, and richly-furnished libraries. The proficiency of the pupils when quitting the gymnasium is generally higher than that of Scottish and English students when leaving the university; while in the university it is beyond comparison superior to anything we have in this country. In Prussia alone there are now nine universities—viz., those of Berlin, Halle, Bonn, Breslau, Greifswald, Königsberg, Kiel, Göttingen, and Marburg—the first three of which are the most famous, while the last three are situated in the states recently incorporated. There are only four universities in the other twenty states —viz., Leipzig in Saxony, Rostock in Mecklenburg-Schwerin, Giessen in Hesse-Darmstadt, and Jena in Saxe-Weimar.

Literature.—With the exception, perhaps, of the British Isles, no other portion of Europe, of equal size, can boast of such a galaxy of illustrious names in every department of literature, science, and art. In the following list we do not distinguish the natives of North and South Germany from those of the Germanic portions of Prussia and Austria :—

POETRY: Ofterdingen (the probable collector of the poems forming the "Niebelungen Lied," the Iliad of the Germans), Hutten, Opitz, Gellert, Klopstock, Burger, Wieland, Herder, Göthe, Schiller, Uhland, Körner, Voss. HISTORY: Pfeffel, Hüllmann, Bahr, Rotteck, Gœrres, Becker, Schlözer, Leo, Heeren, Wachler, Gervinus, Raumer, Wachsmuth, Klemm, Gülich, Menzel, Ranke. PHYSICAL SCIENCE: Albertus Magnus, Copernicus, Kepler, Cluverius, Blumenbach, Olbers, Encke, W. Herschel, Tennemann, Ritter, Berghaus, Leopold von Buch, Alexander von Humboldt, Liebig, Rammelsberg, Bischoff, Naumann, Mohs, G. Rose, Haidinger, Meckel, Mitscherlich. MENTAL PHILOSOPHY and JURISPRUDENCE: Leibnitz, C. Wolf, Brucker, Kant, Jacobi, Fichte, Schelling, Hegel, Puffendorf. SACRED LITERATURE: Ulphilas (translator of the Gothic version of the Gospels), Tauler, Luther, Melancthon, Spalatin, Böhme, Arndt, Spener, Franke, Sturm, Zinzendorf, Mosheim, Bengel, Michælis, Semler, Rosenmüller, Eichhorn, Griesbach, Knapp, Hug, De Wette, Schrœch, Schleiermacher, Guericke, Hase, Neander, Gieseler, Plank,

Hengstenberg, Tholuck, Tischendorf, Stier, H. Olshausen, Ullmann, Krummacher, Lange. PHILOLOGY: Reuchlin, Buxtorf, Stockius, Ludolf, Fabricius, F. A. Wolf, Adelung, Schleusner, Schneider, Vossius, Freytag, Wahl, Gesenius, Bopp, Grimm, Reiske, Ernesti, Heyne, Buttmann, Matthiæ, Zumpt, Freund, Ewald, Passow, Rödiger, Fürst, Kosegarten. FINE ARTS: In Music some of the more celebrated names are—Handel, Bach, Haydn, Beethoven, Weber, Mozart, Klein, Mendelssohn, Spohr; in Painting—Albert Durer, Elzheimer, Sandrart, Van-der-Faes, Roos, Warner, G. Netscher, Mignon, Kneller, Anna Waser, Denner; and in Sculpture—Dannecker. MISCELLANEOUS: Werner, Kotzebue, Jung Stilling, Zimmermann, Herder, Lessing, Bouterweck, Tieck, Jean Paul Richter, Wagner, A. W. Schlegel, Bunsen, Richard Lepsius.

Government.—The government of Prussia is a hereditary constitutional monarchy, the executive being invested in the king and two chambers—an Upper House, or House of Lords, and a Chamber of deputies, elected by the people, and consisting of 432 members. Every Prussian subject who has attained his 25th year is entitled to vote. The reigning sovereign is William I., brother of the late Frederick William IV., who died in 1861. The minor States, with the exception of the free cities (Hamburg, Bremen, and Lübeck), have a monarchical form of government, generally with two chambers, one of which is elected by the citizens. All the States of the Confederation are represented in their corporate capacity by a parliament which sits at Berlin under the presidency of the King of Prussia. It consists of two bodies—a Federal Council of 43 members (17 of whom represent Prussia), and a House of Representatives, elected by universal suffrage, at the rate of one member for every 100,000 inhabitants. *Army and Navy.*—The army of the entire Confederation, and which is under the exclusive control of Prussia, consisted, in 1869, of 546,505 men (on the war footing), with a reserve of 214,700, and garrison troops, 270,000—forming a total of 1,021,000. But in time of peace the army amounts to 311,985. The navy consists of 87 vessels, with 547 guns, and 8870 horse-power. The total *Receipts* of the various States amounted, in 1868, to £25,380,472; the *Expenditure* to about an equal sum, and the Public Debt to £62,120,000.

Commerce, Manufactures, Exports, and Imports.—Until the formation of the Zollverein or Customs' League in 1818, trade was greatly trammelled by each petty State in Germany exacting dues from every vessel that touched its frontiers. Since then, however, only one charge has been levied, and the proceeds divided among the different states forming the League, in the ratio of their respective populations. The late war brought the Zollverein to an end, but in 1867 a new treaty, on an enlarged basis, was concluded, embracing all the States of both North and South Germany, with the exception of Hamburg, Bremen, Lübeck, and Altona, which for the present are ports of free importation. In 1868 the gross receipts of the Zollverein amounted to 27,319,525 thalers, or £4,097,928. Of this sum 19,900,000 thalers were received by Prussia, 2,655,000 by Saxony, 1,407,000 by Bavaria, 575,000 by Würtemberg, and 1,165,000 by

Baden. The mercantile marine of Prussia has been largely increased by the acquisition of Hanover and Schleswig-Holstein, and in 1865 numbered 10,427 vessels, carrying about 852,000 tons. The principal exports from Prussia and North Germany are corn, timber, wines, horses, horned cattle, coals, wool, oil, flax, hops, tobacco, mineral waters, and distilled liquors, together with woollen and linen manufactured goods. Among the articles exported from Prussia to Great Britain are, corn to the value of about £5,000,000 annually, and timber, £1,000,000; while she sends coal in vast quantities to other parts of Germany, France, and Switzerland. In 1866 the production of coal in Prussia amounted to 27,000,000 tons. The chief articles imported into Prussia and North Germany from Great Britain are iron, wrought and unwrought, herrings, and cotton-yarn, amounting, in 1867, to £2,886,000, and colonial produce, raw cotton, and silks. The exports from Danzig and Stettin in 1866 amounted to £5,268,000, and the imports to £7,973,000. The manufactures are numerous and important, but chiefly for home consumption. Those of Prussia consist for the most part of textile fabrics, machinery, beet-root sugar, porcelain, earthenware, paper, leather, musical instruments. Cotton is manufactured extensively at Elberfeld and Barmen, linen at Bielefeld and Liegnitz, cutlery and arms at Solingen, silks and velvets at Crefeld, woollen stuffs at Potsdam, while Berlin is the great seat of the manufacture of artistic articles, such as "Berlin ware," jewellery, toys, and musical and philosophical instruments. Brewing and distilling are extensively carried on in all parts of the kingdom. In the other states of the Confederation the principal manufactures are cotton and woollen goods, and "Dresden china" in Saxony and Brunswick; beer, leather, paper, wooden and straw ware, linen, &c., in the smaller States.

Inland Communication.—Internal communication, both by land and water, is in a highly efficient state, consisting of many navigable rivers connected by canals, excellent roads, and a perfect network of railways. At the beginning of 1867 there were in Prussia 5794 miles of railroad open for traffic, and in the other States of North Germany 1092 miles—making a total of 6886 miles, while in the end of 1869 the number of miles in the whole Confederation amounted to 7734 miles. Berlin is connected by rail with all the more important towns in Prussia, and with the capitals of all the other States of the Confederation; while other important lines, following the courses of the Rhine, Elbe, and Oder, serve to connect Northern and Southern Germany

---

SOUTH GERMANY.

Position and Boundaries.—N.E., Saxony; N.W., the Maine, separating it from Prussia; W., France, from which it is separated for the most part by the Rhine; S., Switzerland and the

Tyrol; E., Upper Austria and Bohemia. Lat. 47° 20′—50° 41′ N.; lon. 7° 5′—13° 48′ E.

Carlsruhe, cap. of Baden, and on the central parallel of 49°, has the same latitude as Paris, Regensburg, Lemberg, Poltava, New Westminster in British Columbia, and the southern boundary of British North America: and has the same longitude as Christiansand, Oldenburg, Lucerne, Milan, Cagliari, and Old Calabar. The general outline is rectangular, nearly square; its greatest length, which is from E. to W., is about 250 miles; while its extreme breadth, from N. to S., does not exceed 220. South Germany nowhere approaches the sea, but the Rhine, which is navigable for steamers up to Basle and for small craft to Chur, forms a large portion of the southern and western boundary; while its tributary, the Maine, which bounds it on the N.W., is navigable as far up as Bamberg.

Area and Population.—The united area of the five states composing South Germany is 44,532 sq. miles, or nearly half the size of Great Britain; while the aggregate population, in 1867, amounted to 8,567,880, being about one-third the population of the latter. South Germany is very densely peopled, having 191 persons to each sq. m. The names, area, and population of the different States are as follows:—

	Sq. m.	Pop. 1867.
Kingdom of Bavaria, ...	29,342	4,824,421
Kingdom of Würtemberg, . . .	7,533	1,778,396
Grand Duchy of Baden, ...	5,912	1,434,970
Grand Duchy of Hesse-Darmstadt, S. of the Maine,	1,683	521,773
Principality of Liechtenstein, . . .	62	8,320
Total, . .	44,532	8,567,880

Political Divisions.—South Germany consists at present of five independent states, loosely connected by treaties, and under the nominal ascendancy of Bavaria. The portion of Hesse-Darmstadt lying N. of the Maine is embraced in the North-German Confederation.

Bavaria.—MUNICH 171, Landshut 12 (Isar), Passau 13, Straubing 11, Ratisbon or Regensburg 30, Ingolstadt 17 (Danube), Amberg 12 (Vils), Kempten 11 (Iller), Augsburg 50 (Lech), Spires or Speyer 15, Germersheim 10 (Rhine), Kaiserslautern 15 (Lauter), Aschaffenburg 10, Würzburg 42 (Maine), Landau 11 (Queich), Bamberg 26, Erlangen 12, Fürth 22, Schwabach 10 (Regnitz), Nüremberg 78 (Pegnitz), Anspach 13 (Rezat), Baireuth 19 (Red Maine), Hof 14 (Saale).
Freising, Neuburg, Eichstadt, Dinkelsbuhl, Nordlingen, Memmingen, Zweibrücken, Pirmasens, Kissingen, Schweinfürt, Rothenburg, *Hohenlinden*.

Würtemberg.—STUTTGART 76 (Nesenbach), Reutlingen 14 (Eschatz), Ludwigsburg 12, Heilbronn 17, Esslingen 17 (Neckar), Ulm 25 (Danube).
Cannstadt, Kirchheim, Tubingen, Rottenburg, Hall, Gmünd, Göppingen, Ehningen, Tuttlingen.

Baden.—CARLSRUHE 32 n., Mannheim 34 (Rhine), Heidelberg 18 (Neckar), Pforzheim 16 (Ens), Rastadt 11 (Murg), Freiburg 21 (Dreisam).
Constance, Weinheim, Bruchsal, Bretten, Lahr, Baden-Baden.

Hesse-Darmstadt.—DARMSTADT 31 (Darm), Giessen 10 (Lahn), Mayence or Mainz 43, Worms 12 (Rhine), Offenbach 20 (Maine).

Liechtenstein—VADUZ, or Liechtenstein 2 (Rhine).

Descriptive Notes.—The five States above enumerated contain only one town above 100,000 inhabitants (Munich); three between 100,000 and 50,000 (Nuremberg, Stuttgart, Augsburg); ten between 50,000 and 20,000 (Mayence, Würzburg, Mannheim, Carlsruhe, Darmstadt, Ratisbon, Bamberg, Fürth, Freiburg, Offenbach); and twenty-five between 20,000 and 10,000.

Munich (*Ger.* München), cap. of Bavaria, in the midst of a sterile plain, is, with the exception of Madrid, the loftiest city in Europe, having an elevation of 1690 feet: for the most part it is of modern erection, is by far the most populous city in South Germany, and, in regard to its treasures in painting and sculpture, is unrivalled in Germany. It has been embellished and extended during the last century on a scale unknown in any other European city, except Paris: it contains numerous splendid edifices in every known style of architecture, among which are the university, the palace, and the picture-gallery. Near it is **Hohenlinden**, where, in 1800, the French totally defeated the Austrians. **Passau** is strongly fortified, and forms the defence of Bavaria against Austria. **Ratisbon**, long the cap. of Bavaria, and, from 1663 to 1808, the permanent seat of the Imperial Diet: here lie the remains of Kepler, and here Napoleon was wounded in battle in 1809. **Augsburg**, an important city, the principal arsenal of the kingdom, and the great emporium for German, Italian, and Greek wines; in regard to banking and exchange operations, it is second only to Frankfürt; but it is chiefly celebrated for the Confession of Faith which the Protestants presented here to Charles V. in 1530. **Spires**, noted as the place where the Reformers, in 1529, presented their famous protest to the Emperor, which originated the religious designation of Protestants. **Würzburg**, a university town, was formerly the cap. of Franconia. **Bamberg** is extensively engaged in raising and preparing liquorice and medicinal plants. **Erlangen** contains the only Protestant university in Bavaria. **Fürth**, next to Nuremberg, the most important manufacturing town in the kingdom, the staple commodities being toys and fancy articles. **Nüremberg**, the great toy-mart of Germany, is famous for its numerous inventions in the mechanical arts, as the watch, gun-carriages, copperplate-engraving, musket, clarion, &c. **Stuttgart**, the most beautifully-situated capital in Germany, is of very recent origin; contains the royal palace, adorned by Flemish paintings and sculptures by Dannecker and Canova, and the royal library of 360,000 volumes, including a unique collection of 9000 bibles, printed in 80 different languages. **Ulm**, a fortified town on the Danube, where it begins to be navigable, contains one of the finest Gothic cathedrals in Germany: here the Austrian General, Mack, capitulated to Napoleon in 1805. **Carlsruhe** ("Charles's rest"), the cap. of Baden, in the valley of the Rhine, is an elegant city, with its 32 streets diverging from the palace like the rays of a fan: has manufactures of jewellery, carpets, and chemical products. **Mannheim**, at the confluence of the Rhine and Neckar, is well situated for commerce, and is the most populous city in Baden. **Heidelberg**, famous for its romantic scenery, its flourishing university, and an ancient castle, long the residence of the Electors-Palatine. **Pforzheim**, noted as being the birthplace of Reuchlin. **Rastadt**, a federal fortress of the late Germanic Confederation, is celebrated for the treaty of

1714 between Villars and Eugene, the battle of 1796 between the French and Austrians, and the congress of 1799. **Freiburg**, noted for its magnificent Gothic cathedral, with a pyramidal spire 380 feet high : contains a Roman Catholic university, which is well attended. **Constance**, the seat of a famous council in 1414, which sentenced John Huss and Jerome of Prague to the flames. **Bretten**, the b.p. of Melancthon, in 1497. **Baden-Baden**, with hot saline springs, is a celebrated watering-place. **Darmstadt**, cap. of the grand duchy, is a handsome town, with a magnificent ducal library. **Giessen**, the seat of a famous university, rendered illustrious by Baron Liebig's discoveries in organic chemistry. **Mayence** (*Ger.* Mainz), the most populous town in the grand duchy, and one of the strongest fortresses in Europe, forms the great bulwark of Germany against France : it is the b.p. of Guttemberg, the inventor of printing (1440). **Offenbach**, the chief industrial town in the state, is noted for its bookbinding and manufacture of carriages. **Worms**, famous for the Diet of 1521, where Luther was outlawed.

Surface and Mountains. — The surface is hilly, and frequently mountainous. A branch of the Rhætian Alps from Austria forms the southern boundary of Bavaria and Würtemberg, separating the Inn from the Isar, and the basin of the Rhine from that of the Danube, but nowhere attaining the limit of perennial snow, which in the Alps has an elevation of 8900 feet. Proceeding northwards, the different ranges are as follows :—

The *Schwartzwald*, or "Black Forest," in Baden, separates the Rhine from the Neckar ; maximum elevation, 4675 feet.

The *Rauhe Alp*, or Swabian Alps, in Würtemberg, between the Danube and Neckar, 3300 feet.

The *Böhmerwald*, between Bavaria and Bohemia, separates the Danube from the Moldau, an affluent of the Elbe, 4613 feet.

The *Erzgebirge*, between Saxony and Bohemia, separates the basins of the Elbe and Danube, 2500 feet.

The *Fichtelgebirge*, in the N.E. of Bavaria, separates the affluents of the Danube from the rivers that find their way northward, 3481 feet.

The *Thüringerwald*, in the Sachsen States, and between the sources of the Werra and Saale, 3286 feet.

The *Rhöngebirge*, in the N.W. of Bavaria, separates the Fulda and Werra from the Kinzig and Maine, 2300 feet.

The *Odenwald*, in Hesse Darmstadt, forms a continuation of the Schwartzwald, and separates the Maine from the Neckar, 2300 feet.

The *Westerwald*, in Nassau, between the Sieg and Lahn, 2850 feet.

The *Eifel*, in Rhenish Prussia, between the Moselle and Ahr, 2200 feet.

The *Harzgebirge*, or Harz Mountains, in Brunswick, and the S. of Hanover, between the Weser and the Elbe, 3230 feet.

River-Basins.—For the river-basins see under "North Germany," and for the table of rivers and towns see under "Austria."

Lakes.—*Boden See* or *Lake of Constance*, bet. South Germany and Switzerland, traversed by the Rhine, of which it forms the great reservoir; length 42 m., breadth 8 m., elevation 1255 feet, depth 964 feet; the shores are generally flat, but the snow-clad Alps in the distance have an imposing effect; its waters are subject to a sudden rise and fall, without apparent cause. Other lakes are *Ammer See*,

Würm See, and *Chiem See* in the S. of Bavaria, drained by affluents of the Isar and Inn, tributaries of the Danube.

Climate.—In all parts of Germany the mean annual temperature is nearly the same, the greater elevation of Southern Germany compensating for its lower latitude. Here the sky is more serene and the climate much drier than in North Germany. The mean annual temp. of Carlsruhe, in the central parallel, is 51°.5—winter, 34°.6; summer, 66°.3. At Ulm, on the Danube, the annual fall of rain is 28 inches, and in N. Germany 22½ inches, but it varies greatly in different parts. Except in the valley of the Rhine, the climate is generally very cold, and the mountains rarely free from snow.

Geology and Minerals.—The region south of the Danube is occupied with tertiary strata; the large district lying between the Rhine, Maine, Naab, and Danube is covered with secondary rocks; the palæozoic series rarely appears, while E. of the Naab, granitic rocks prevail, especially in the Böhmerwald.

The principal mineral products of the various states of South Germany are—*Bavaria:* salt (formerly a Government monopoly), obtained from the rock and by evaporation; iron and coal, found in many places; copper, manganese, quicksilver, and cobalt, in Rhenish Bavaria. *Würtemberg:* salt, iron, and coal are abundant, while silver, copper, lead, bismuth, and malachite are found in small quantities. The mineral products of *Baden* are chiefly alum, sulphur, silver, iron, copper, lead, and coal; gold-washing, formerly general along the Rhine, is now insignificant. Iron, coal, and salt abound in *Hesse-Darmstadt*. The principal mineral springs are those of Kissingen, Brückenau, and Rosenheim, in Bavaria; Wildbad, in Würtemberg; Baden-Baden, in the Grand Duchy of Baden.

Botany and Agriculture.—For the number of species of plants in Germany, as also for a description of the culture and exportation of the German wines, we refer the student to the corresponding article under "Prussia and North Germany."

In South Germany, about three-fifths of the entire area is under cultivation, and the soil is generally very fertile. Nearly all the cereals are grown on the lower grounds, and considerable quantities of corn are exported from the various states. The vine is extensively cultivated in the valleys of the Rhine and Maine, and to a smaller extent in the plain of the Danube, and on the shores of Lake Constance. Baden alone produces annually about 14,000,000 gals. of excellent wine, Würtemberg nearly 5,000,000 gals., while Rhenish Bavaria has been long celebrated for its Stein and Leisten wines. Hops and the tobacco-plant are very largely grown, and Bavaria exports large quantities of beer, nearly 100,000,000 gals. being annually produced. About one-third of South Germany is covered with forests, chiefly pine and fir trees. The Schwarzwald ("Black Forest"), in Baden, is especially celebrated for its immense forest of gigantic trees, some of them attaining the height of 180 feet.

Zoology.—The fauna of all Germany has been noticed above. In regard to tame animals, cattle-rearing is the exclusive industry of the Alps and other mountainous districts, while horses, sheep, and goats are extensively raised in all the southern states. The silkworm has been recently introduced into Bavaria, and the rearing of bees forms

an important occupation in Baden. The other domestic animals are the same as in England.

Ethnography.—The people and language are the same as in North Germany (which see).

Religion and Education.—Of the 8,567,000 inhabitants of the southern states, 4,672,000 are Roman Catholics, being 54 per cent of the whole population; while 3,818,000 are Protestants, being 44 per cent of the whole. Bavaria and Baden may be styled Catholic countries, the Catholics being to the Protestants as 2 to 1 in the former state, and 3 to 1 in the latter. Protestants, however, greatly outnumber the Roman Catholics in Würtemberg and Hesse-Darmstadt, being in the former as 2 to 1, and in the latter as 3 to 1. The number of Jews in the five states is estimated at 105,000. In Bavaria, the Roman Catholic Church is richly endowed, possessing property amounting to above £8,500,000, besides which the State pays £130,000 annually to the clergy. Protestants, however, enjoy complete religious liberty, and are eligible to all civil and military appointments. In Baden, the Roman Catholic Church is under the supreme management of an archbishop appointed by the Pope, and is quite independent of the Government. Frequent disputes between the Church and the state have been the result. In Würtemberg, the supreme direction of the Protestant Church is vested in the King, and Protestantism is virtually, though not formally, the religion of the state. Education is in a very advanced state throughout South Germany, especially in Würtemberg, where it is rare to find any one who cannot read and write. Attendance at school is compulsory in all the states; every village, and even hamlet, has its primary school, and in Würtemberg a full sixth of the population is under tuition. There are 7 universities —viz., those of Munich, Würzburg, and Erlangen, in Bavaria; Tübingen, in Würtemberg; Heidelberg and Freiburg, in Baden; and Giessen, in Hesse-Darmstadt.

Government.—In all the states the form of government is monarchical, but the title of King is confined to the sovereigns of Bavaria and Würtemberg. Representative institutions are common to all the states, the executive power resting in the sovereign, the legislative in a parliament consisting of two houses, and all functionaries being responsible. The total armed force amounts, in time of war, to 142,895 men, or to 90,421 in time of peace. Of the latter, 49,949 belong to Bavaria, 14,150 to Würtemberg, 14,812 to Baden, and 11,510 to Hesse-Darmstadt. By virtue of special treaties between Prussia and each of the states of South Germany, the former, in time of war, is virtually placed in command of their armies, while, as a matter of course, none of them possesses a navy. The aggregate revenue and expenditure of these states, in 1866, amounted to £7,684,304, about one-half of which pertained to Bavaria, while the aggregate public debt amounted to £45,324,167.

Commerce, Manufactures, and Inland Communication.—These states, being wholly inland, cannot vie with their neighbours in regard to the extent of their commerce. Still the transit trade between Italy, Switzerland, Austria, and North Germany, carried on mainly by steamers on the Rhine, Maine, Neckar, and even the Danube (below Ulm), is very considerable. The Danube also communicates by the Ludwig's canal with the Maine and Rhine, and thus materially facilitates internal communication. Manufacturing

industry is highly developed, except in Bavaria, where wine-making and the brewing of beer are the principal products. Coarse linens, cotton, woollen, and silk stuffs are largely manufactured, together with tobacco, leather, iron and steel goods, machinery, paper, cabinet-work, papier-maché, porcelain, jewellery, toys, so-called Dutch clocks, and mathematical and optical instruments, which are held in high repute. Bookbinding and the construction of carriages are largely carried on in Hesse-Darmstadt. The exports consist chiefly of wine, timber, corn, salt, beer, leather, tobacco, cattle, glass, jewellery, oils, and drugs; and the imports, of sugar, coffee, silk, wool, hemp, and flax. Railway communication has made great progress: in 1869 the total number of miles in operation was 2977, together with 4362 miles of telegraph wires.

AUSTRO-HUNGARIAN EMPIRE.

Boundaries. — N., Poland, Silesia, and the kingdom of Saxony; W., Bavaria, Switzerland, and Lombardy; S., Venetia, the Adriatic, and Turkey; E., Moldavia and Russia.

Omitting Dalmatia and the southern portion of Croatia, which extend southward along the eastern shore of the Adriatic to nearly the 42d parallel, the remainder of the empire lies between lat. 45° and 51° N., and between lon. 9° 41′ and 26° 35′ E. Vienna, the capital (lat. 48° 13′, lon. 16° 23′), in the centre of the empire, is nearly on the same parallel as Brest, Munich, Czernowitz, Ekaterinoslav, Ourga, Victoria (Vancouver I.), and St John's (Newfoundland); and on the same meridian as Stockholm, Posen, Cape Spartivento, Lake Tchad, and the mouth of the Orange River. Omitting the Tyrol and Dalmatia, the general form is that of an oblong square, 670 miles long by 420 miles broad, having Buda, the capital of Hungary, in the centre; but the extreme length of the empire, from Lake Constance on the W. to the eastern confines of Transylvania, is about 800 miles, and the extreme breadth, from N. to S., 690 miles. Austria is essentially an inland country, her coast-line, which does not exceed 480 m., being wholly confined to the E. side of the Adriatic. This gives only 1 mile of coast to every 500 sq. m. of surface. With her present boundaries, therefore, Austria can never become a great maritime power.

Area and Population.—By the cession to Italy of Lombardy in 1859, and of Venetia in 1866, the area is now reduced to 240,351 sq. miles, or considerably less than twice the area of the British Isles. With the exception of Russia, however, Austria is still by far the largest state in Europe. In 1868, the population of the empire was estimated at 36,000,000, being one-sixth more than that of the United Kingdom, and two millions less than the population of France. This allows 108 persons to each sq. mile of surface. About one-fourth of the entire population (9,040,000) are Germans, one-half (16,000,000) Sclavonians, while the remaining fourth is made up of Magyars, Italians, and other races.

Political Divisions.—The Austrian empire, or Austro-Hungarian monarchy as it is now called, is at present divided into eighteen crown-lands or provinces, of which ten are German, two Polish, and six Hungarian.

TEN GERMAN PROVINCES.

Bohemia.*—PRAGUE 143, Budweis 15 (Moldau), Pilsen 14 (Bradawka), Kuttenberg 13 (Elbe), Leipa 10 (Pulnitz), Eger 11 (Eger), Reichenberg 19 (Lower Neisse).
Königgrätz, *Sadowa*, Krumau, Klattau, Leitmeritz, Saatz, Chrudim, Leitomischl, Karlsbad, Töplitz, Marienbad.

Silesia.—TROPPAU 14 (Oppa, *affl.* Oder).
Teschen, Bielitz.

Moravia.—BRÜNN 59 (Schwartza, *sub.-affl.* March), Iglau 17 (Iglawa), Olmütz 14, Sternberg 13 n. (March), Prossnitz 12 (Rumza).
Neutitschein, *Austerlitz*, Nicolsburg, Znaym.

Lower Austria.—VIENNA 579 (Danube), Neustadt 15 (Leitha).
S. Polten, Baden.

Upper Austria.—LINZ 28 (Danube), Steyer 11 (Ens).

Salzburg.—SALZBURG 17 (Salza, *affl.* Inn).

Styria.—GRÄTZ 63 (Mur, *affl.* Drave).

Illyria (Carinthia and Carniola).—LAYBACH 21 (Laybach), Klagenfürt 14 (Glan).
Idria, Bleibach.

Görz, Trieste, and Istria.—GÖRZ 13 (Isonzo), Trieste 66 (G. of Trieste), Rovigno 11, Pola 11 (W. coast).
Capo d'Istria, Pirano.

Tyrol and Vorarlberg.—INNSBRÜCK 14 (Inn), Trent 14 (Adige), Botzen 10 (Eisack).

TWO POLISH PROVINCES.

Galicia.†—LEMBERG 70 (Peltew, *affl.* Bug), Cracow 41 (Vistula), Kolomea 15, Sniatyn 11 (Pruth), Sambor 11 (Dniester), Tarnopol 17 (Sered), Stanislau 13 (Bistrica), Drohobicz 11 (Tiszmanicka), Brody 19 (Styr).
Przemysl, Rzeszow, Bochnia, Brzezany, Wieliczka.

Buckowina.—CZERNOWITZ 26 (Pruth).

SIX HUNGARIAN PROVINCES.

Hungary Proper.‡—BUDA or OFEN 55, Pesth 132, Mohacz 11, Funf-Kir-

* For the pronunciation of the German names, see above, p. 238.
† Rules for the pronunciation of Polish names will be found under "N. German Confederation," p. 234.
‡ The following rules will assist the pupil in pronouncing Hungarian proper names:—
ö, ü = same characters in German.
g = *g* in go; this consonant is always hard.
j = *y* in yonder: as Baja (*Bá'ya*).
s = *sh* in shall; as Sajo (*Shá'yo*).
cz = *ts* in wits; as in Debreczin, Czongrad (*De-bret'sin, Tson-grad'*).
cs = *ch* in church; as in Mohacs, Pancsova (*Mo-hatch', Pan-chó'va*).
sz = *sh* in shall; as Szegedin, Veszprim (*She-ge-din', Vesh'prim*).
zs = *s* in vision or French *j*; Zsolna, Zsellesz (*Zhol'na, Zhel'lesh*).
gy = *di* in French Dieu; as Magyar, Gyongyos (*Mad-yar', Dyon'dyos*)
ly = *ll* in million = *gl* in Italian; as Vasarhely (*Va-shar-hel'*)

chen 16 n., Foldvar 11, Alt-Ofen 12, Waitzen 11, Komorn 11, Pressburg 44 (Danube), Szegedin 63, Vasarhely 43 n., Szentes 26, Keszkemet 39, Felegyhaza 19 n., Nagy-Körös 20, Czegled 19, Tokay 6 (Theiss), Mako 25, Arad 27 (Maros), Szarvas 19, Bekes 20, Czaba 28 (Körös), Grosswardein 22 (Sebes Körös), Debreczin 36 n. (Koselo), Kaschau 16 (Hernad), Miskoltz 28 (Sajo), Eperies 10 (Tarcza), Stühlweissenburg 18 (Sarvitz), Gran 11, Schemnitz 14 n., Kremnitz 5 n. (Gran), Raab 18 (Raab), Vasarhely-Somlo 25, Oedenburg 19 (Raabnitz).

Transylvania.—KLAUSENBURG 21 (Szamos), Maros-Vasarhely 11 (Maros), Kronstadt 27 n. (Aluta), Hermannstadt 19 (Zibin).
Karlsburg, Bistritz, Nagy-Enyed, Szasz-Regen, Thorda.

Banat and Servia.—TEMESWAR 23 n. (Temes), Versetz 19 n. (Karash), Neusatz 16, Zombor 22 n., Baja 19 (Danube), Nagy-Kikinda 15, Zenta 17, Theresienstadt 53 n. (Theiss), Becskerek 18 (Alt-Bega).
Lugos, Apatin, Lippa.

Croatia and Sclavonia.—AGRAM 17 (Save), Eszek 14, Warasdin 10 (Drave), Fiume 15 (Adriatic).
Posega, Petrinia, Karlstadt, Zengg.

Dalmatia.—ZARA 19, Bencovas, 10 n., Sebenico 14, Spalatro 16, Ragusa 21 (W. co.), Imoschi 23 n. (Bistritza), Knin 23 (Kerka), Dernis 18 (Cicola), Sign 26 (Cettina), Castel-Nuovo 8 (G. of Cattaro).

Military Frontier.*—PETERWARDEIN 7, Pancsova 12, Semlin 13, Mitrovicz 5 (Save).

Descriptive Notes.—There are, in the Austrian empire, three cities of upwards of 100,000 inhabitants (Vienna, Prague, Pesth); seven between 100,000 and 50,000 (Lemberg, Trieste, Grätz, Szegedin, Brünn, Buda, Theresienstadt); twenty-one between 50,000 and 20,000 (Pressburg, Vasarhely, Cracow, Keszkemet, Debreczin, Czaba, Linz, Arad, Kronstadt, Sign, Czernowitz, Szentes, Mako, Imoschi, Knin, Temeswar, Grosswardein, Zombor, Laybach, Klausenburg, Bekes); and fifty-eight between 20,000 and 10,000.

Prague (*Ger.* Prag), an ancient, large, and fortified city, on both sides of the Moldau, is one of the finest in the empire, and of great historic celebrity: it is the chief seat of the Bohemian manufactures, which consist of thread, linen, cotton, iron, woollen, glass, and paper; contains the oldest university in Austria. Prague contains the tomb of Tycho Brahe, and was the scene of the labours of Jerome of Prague and of John Huss, the celebrated martyrs. **Pilsen** is noted for its iron-mines. **Eger**, where Wallenstein and his friends were assassinated in 1634. **Reichenberg**, a busy manufacturing town on the Neisse. **Königgrätz**; near it **Sadowa**, where the Prussians gained their crowning victory over the Austrians, July 3, 1866. **Brünn**, the principal seat of the woollen manu-

ny = *ni* in opinion = *ñ* Spanish = *gn* in French, as Böszörmeny (*Bosh-or-ming*).
Each of the last seven combinations is to be regarded as one letter of a simple sound, like *th* and *sh* in English.

* The Military Frontier is a strip of country comprising an area of 18,165 square miles, and extends along the Turkish frontier from the Adriatic eastward to Moldavia. It consists of parts of Croatia, Sclavonia, the Banat, and Transylvania. All landed property in this district belongs exclusively to the Government, but is held by a kind of military fief on condition of military service in peace and war. In time of war it furnishes 50,000 men. This system of government was organised in 1807, as a protection against the Turks.

factures of Austria: near it the castle of **Spielberg**, a strong prison for political offenders; and at a short distance **Austerlitz**, the scene of Napoleon's triumph in 1805. **Iglau** has numerous manufactures, and silver and lead mines in the vicinity. **Olmütz**, a strongly-fortified city, once the capital of Moravia, contains a university, and has important woollen, linen, and cotton manufactures. **Vienna**, the capital of the Archduchy of Austria and of the Austrian empire, is the fifth largest and one of the most elegant cities on the Continent: it is situated on the right bank of the Danube, and near the centre of the empire; contains numerous splendid palaces, several of which are converted into magnificent public libraries, one of which, the Imperial Library (founded in 1440, the year in which printing was invented) contains 320,000 volumes and 16,000 MSS. The university is celebrated as a medical school, and had, in 1868, 150 professors. Vienna is surrounded by noble botanic gardens, containing the richest and rarest plants. It is the chief manufacturing city in the empire; has great commerce on the Danube and by railways, and three great annual fairs. Here sat the celebrated Congress of Vienna (in 1815) which fixed the present limits of the different European states. **Linz**, a fortified city on the Danube, 100 miles above Vienna, occupies an important military position. **Salzburg** is famous for its salt-mines, and for being the birthplace of Haydn and Mozart, the eminent composers. **Grätz**, a populous city on the Mur, contains a university; an institution, called the Johanneum, containing rich museums of zoology, botany, mineralogy, and coins; numerous manufactures of textile and hardware goods, and the centre of the trade between the capital and Trieste. **Laybach**, capital of Carniola, has an active transit trade between Vienna and Trieste, with manufactures of porcelain, refined sugar, and linen fabrics. **Idria** is celebrated for its valuable quicksilver-mines. **Görz**, on the Isonzo, has manufactures of silk, leather, &c., and a brisk general trade: here died Charles X., the ex-king of France. **Trieste**, a populous city on the Adriatic, and the great seat of the foreign commerce of the empire; it possesses the same importance for Southern Germany as Hamburg for Northern; maintains a large mercantile fleet; and here reside consuls from most commercial nations. **Pola**, the great naval depot of the empire, is a very ancient town. **Innsbrück**, capital of the Tyrol, has a university with 24 professors, and a number of other educational establishments; with manufactures of silk, woollen, and cotton goods, and considerable trade. **Trent** (*Ger.* Trient), on the left bank of the Adige, is chiefly memorable for the Council of ecclesiastics held here, 1545–1563. **Botzen**, the most important commercial town in the Tyrol. **Lemberg** has a university, attended by 1000 students, and numerous other literary establishments; great trade in corn, cattle, and coal; and several manufactures. One-third of the population are Jews, who are also numerous in all parts of Galicia. **Cracow** (*Ger.* and *Pol.* Krakau), the ancient capital of Poland, and more recently of a small republic which was annexed to Austria in 1846, is celebrated for its cathedral, which contains the tombs of many Polish kings; it has a university, the library of which is rich in MSS., and near it is a tumulus erected to the memory of the heroic Kosciusko, the William Tell of Poland, who died in Switzerland in 1817. **Sambor**, **Bochnia**, and **Wieliczka**, are famous for their magnificent mines of rock-salt, the last named being the most celebrated in the world. It contains a subterranean town, with streets, churches, statues, &c., all cut out of the solid salt rock, the effect of which is very striking; but the most remarkable circumstance is that the mine contains a small lake and rivulet of fresh water. **Drohobicz** has iron-mines, salt-works, and pitch-

wells in the vicinity. **Brody** maintains an extensive trade with Russia, Poland, and Turkey. **Czernowitz**, capital of the new province Buckowina, has manufactures of clocks, hardware, and silver goods. **Buda** and **Pesth**, on opposite sides of the Danube, but connected by a huge suspension-bridge, form together the capital of the ancient kingdom of Hungary, now restored to much of its former independence. Buda (*Ger.* Ofen), derives its name from its hot sulphur-springs. It is an ancient city, was long in possession of the Turks, who were expelled in 1686, and still contains the regalia of Hungary; it carries on an extensive commerce in wine of excellent quality. Pesth contains a university which has 49 professors, and is attended by about 1000 students. **Komorn**, at the confluence of the Danube and Waag, is one of the strongest fortresses in Europe. **Pressburg**, the ancient cap. of Hungary, the seat of the Hungarian Diet, and the place where the Emperors of Austria are crowned kings of Hungary, is a quiet country town, surrounded by rich vineyards. **Szegedin**, a fortified manufacturing town in the centre of the Hungarian plain, is a place of great trade. **Vasarhely**, the seat of several annual fairs. **Keczkemet**, with five great annual fairs for horses and cattle, has a large trade in corn, wine, and fruit. **Tokay**, a small town in the Theiss, is famous for its wine, the most costly in Europe. **Mako** is largely engaged in the manufacture of wine. **Arad**, with the largest cattle-market in Hungary. **Grosswardein**, with hot mineral springs, is strongly fortified. **Debreczin** contains a Calvinistic college, the most important institution of the kind in the empire. **Miskoltz**, a considerable town, with iron-mines, from which is made the best steel in the empire. **Schemnitz** and **Kremnitz**, two celebrated mining towns, where mines of gold, silver, lead, copper, iron, sulphur, and arsenic are wrought. **Raab**, where the French defeated the Austrians in 1809, is a steam-packet station, at the confl. of the Raab and Danube. **Vasarhely-Somlo** is extensively engaged in raising wine and tobacco. **Oedenburg**, near lake Neusiedler, is an extensive mart for the wine grown in its vicinity. **Klausenburg**, the cap. of Transylvania, an important manufacturing town, is the birthplace of Matthias Corvinus, one of the greatest kings of Hungary. **Kronstadt**, the most populous and commercial town in the province. **Hermanstadt**, the residence of the military commander of Transylvania, a Greek bishop's see, and the seat of Roman Catholic and Lutheran gymnasia, has a fine national museum. **Karlsburg**, a small town, with the richest gold-mines in the empire. **Temeswar**, capital of Banat and Servia, is a strongly-fortified town on the Temes; it has manufactures of silk and woollen stuffs, iron-wares, paper, tobacco, and oil, and an extensive trade; it was taken by the Turks, under Solyman II., in 1551, and retaken by Prince Eugene in 1716. **Versetz**, a fortified town near the Karash, engaged in raising wine, silk, and rice. **Neusatz**, one of the steamboat stations on the Danube, is a place of great trade. **Zombor**, with manufactures of silk, and trade in grain and cattle. **Theresienstadt**, the most populous town in the Banat, consists of an aggregation of villages, with manufactures of linen, leather, and tobacco. **Agram**, capital of the united province of Croatia and Sclavonia, a considerable town on the Save, contains a fine cathedral and several monasteries. **Eszek**, a strongly-fortified town on the Drave, with barracks capable of accommodating 30,000 men. **Warasdin**, a fortified town on the same river, with sulphur-baths and extensive vineyards. **Fiume**, a royal free seaport town on the Gulf of Quarnero, and the outlet for the produce of Hungary. **Zara**, a small town on the Adriatic, capital of the kingdom of Dalmatia, the see of an archbishop, and strongly fortified. **Spalatra**,

noted for its Roman antiquities, is the most important seat of commerce in Dalmatia. **Ragusa**, a strongly-fortified seaport town with an active coasting trade, is frequently visited by earthquakes. **Peterwardein**, so called after Peter the Hermit, who here marshalled the first crusade, is a most formidable military position on the south or right bank of the Danube, opposite Neusatz, with which it communicates by a bridge of boats: it was the scene of a great victory over the Turks, in 1716. **Pancsova**, a considerable trading town on the left bank of the Danube, is well fortified.

Capes and Islands.—Salvatore and Punta di Promontore, S. of Istia, are the only capes. ISLANDS.—Two groups in the Adriatic—viz., the Illyrian archipelago in the Gulf of Quarnero, principal, Veglia, Cherso, and Lossini; and the Dalmatian archipelago on the west coast of Dalmatia, principal, Ugliano, Grossa, Brazza, Lesina, Curzola, and Meleda.

Seas, Gulfs, and Straits.—The Adriatic in the S.W., the chief branches of which on the eastern side are—Gulfs of Trieste and Quarnero, S. of Illyria; Morlacca Channel, between Croatia and the Illyrian archipelago; Gulf of Cattaro, S.W. of Dalmatia.

Surface and Mountains.—Austria is a highly-mountainous country, for although it contains several extensive plains, as the Plain of Hungary and the Plain of Lower Austria, it is traversed by three great mountain-systems—viz., the Alps, the Sudetic Mountains, and the Carpathians.

THE ALPS in the S.W., extending from the Swiss frontier to near Vienna, and consisting of several chains, as the *Carnic Alps*, between Venetia and the Tyrol; highest summit, La Marmolata, in S.E. of Tyrol, 11,500 feet, between the basins of the Piave and Drave: the *Rhætian Alps* in Tyrol, between the basins of the Adige and Inn; with Ortler Spitz, the culminating-point of Austria, 12,789 feet, in S.W. of the Tyrol: the *Noric Alps*, extending from the Tyrol to near Vienna, and separating the Danube from the Drave; highest summit, Gross Glockner, in E. of Tyrol, 12,776 feet: the *Julian Alps* in Illyria, and the *Dinaric Alps* in Croatia and Dalmatia, between the Save and the Adriatic; highest summit, Mount Terglou, in central Illyria, 9343 feet.

THE SUDETIC OR BOHEMIAN AND MORAVIAN MOUNTAINS, forming the N.W. frontier, and consisting of the *Böhmerwald*, *Erzgebirge*, *Riesengebirge*, and *Sudetic Mountains* (see under "N. German Confederation").

THE KRAPACKS OR CARPATHIANS in the east, forming a great curve, one extremity of which abuts on the Danube at Pressburg, and after separating Hungary from Galicia, and Transylvania from Moldavia and Wallachia, returns to the Danube at Orsova. The Carpathians form a part of the great water-parting of Europe, separating the basin of the Danube from those of the Vistula and Dniester. They are usually divided into two great sections—viz., the *Western Carpathians*, between Hungary and Galicia, and forming a crescent-shaped ring around the head-waters of the Theiss: highest summit, Gerlsdorfer Spitze, in the Tatra group, 8685 feet; and the *Eastern Carpathians* or *Transylvanian Alps*, between Transylvania and the Danubian principalities, separating the basin of the Theiss from that of the Lower Danube: highest elevation, Mount Botschetje, south of Kronstadt, 9528 feet. This mountain, to-

gether with many other summits, rises far above the snow-line, which, in this latitude, is about 6000 feet.

MOUNTAIN-PASSES.—The principal passes are the *Jablunka Pass*, on the route from Pressburg to Cracow, lon. 19° E.; *Borgo Pass*, between Bistritz and Bukowina; Gymes Pass, between Transylvania and Moldavia; *Bozo Pass*, *Tursburg Pass*, *Rothenthurm Pass*, and *Vulcan Pass*, between Transylvania and Wallachia; *Stelvio Pass*, 9100 feet, from Bormio in Lombardy to Glurus in the Tyrol; and the *Brenner Pass*, between the valleys of the Inn and Adige, 4650 feet high. The Austrian Government has made all these passes available for wheeled carriages at an enormous expense.

River-Basins.—Notwithstanding the great extent of the Austrian empire, the only great river-basin contained in it is that of the Danube, and even it only partially, its sources being in South Germany, and its lower basin in Turkey. Its direct length is estimated at 980 miles, and its area at 306,000 English square miles. The empire also embraces the upper basins of the Elbe (area of basin, 55,000 sq. m.), the Oder (45,200 sq. m.), and the Vistula (72,300 sq. m.)

The River-System of Central Europe.—The following table comprises the river-system of Central Europe from the Pregel to the Rhine, together with the basin of the Danube and the N.E. coast of the Adriatic. Capitals of kingdoms and provinces are distinguished by SMALL CAPITALS, towns of more than 10,000 inhabitants by Roman letters, and those between 5000 and 10,000 by *Italics*.

Basins inclined to the Baltic.

Rivers.	*Towns.*
Pregel,	KÖNIGSBERG, Insterburg, *Gumbinnen*.
Passarge,	Braunsberg.
Elbing,	Elbing.
Vistula,	Danzig, *Marienburg*, *Marienwerder*, n., Graudenz, *Kulm*, Bromberg, n., Thorn, PLOCK, WARSAW, Cracow.
Brahe, *l*	Bromberg.
Bzura, *l*	Lodz.
Bug,	Brzesc-Litewski.
Narew,	*Pultusk*.
Bobr,	*Augustowo*, n.
Bialy,	Bialystok.
Lul,	*Vladimir*.
Peltew, *l*	LEMBERG.
Radomka, *l*	RADOM.
Wieprz,	*Zamosz*.
Bistritza, *l*	LUBLIN.
Saan,	*Przemysl*.
Wisloka, *l*	*Rzeszow*.
Raba,	*Bochnia*
Biala, *l*	*Bielitz*.
Stolpe,	Stolpe.
Niesenbecke,	Köslin.
Persante,	Colberg.

Rivers.	*Towns.*
Rega,	*Neu-Treptow*, *Greifenberg*.
Oder,	STETTIN, *Schwedt*, Königsberg, n., Küstrin, Frankfürt, *Crossen*, Glogau, BRESLAU, *Ohlau*, Brieg, Oppeln, Ratibor, *Neutitschein*, n.
Ucker, *l*	*Pasewalk*, Prenzlow.
Ihna,	*Gollnow*, Stargard.
Wartha,	Landsberg, POSEN, Czentochov.
Netze,	*Inowrazlaw*.
Obra, *l*	Lissa.
Wilna,	*Gnesen*.
Prosna, *l*	Kalisz, *Kempen*, n.
Lower Neisse, *l*	Guben, Görlitz, Reichenberg.
Mandau, *l*	Zittau.
Bober, *l*	*Sagan*, Sorau, n., *Bunzlau*, Hirschberg.
Queiss, *l*	*Lauban*.
Lunze, *l*	Grünberg.
Bartsch,	*Fraustadt*, n., Rawitsch.
Orta,	*Krotoszyn*.
Katzbach, *l*	Liegnitz, *Jauer*, n., *Goldberg*.

Basins inclined to the Baltic (continued).

Rivers.	*Towns.*
Weistritz, *l*	Schweidnitz.
Striegauer, *l*	*Striegau.*
Peile,	*Reichenbach.*
Oelsa,	*Oels.*
Upper Neisse, *l*	Neisse, *Frankenstein*, Glatz.
Holzem-plotz, *l*	*Neustadt*,
Klodnitz,	Gleiwitz, Beuthen.
Zinna, *l*	*Leobschütz.*
Olsa,	*Teschen.*
Oppa, *l*	Troppau.
Peene,	*Wolgast*, Anclam, *Demmin.*
Str. of Gellen,	Greifswald,
Warnow,	Rostock.
Nebal,	Gustrow.
Co. of Mecklenburg-Sch.,	Wismar.

Basins inclined to the North Sea.

Elbe,	Glückstadt, Altona, Hamburg, Harburg, Magdeburg, *Schönebeck*, Dessau, Wittenberg, Torgau, *Oschatz*, Meissen, Dresden, *Pirna*, *Töplitz*, *Leitmeritz*, Kuttenberg, *Königgrätz.*
Schwinge, *l*	*Stade.*
Stör,	*Itzehoe.*
Ilmenau, *l*	Lüneburg.
Elde,	*Grabow*, *Ludwigslust*, *Parchim.*
Biese, *l*	*Gardelegen*,
Uchte,	*Stendal.*
Stepnitz,	*Perleberg.*
Dosse, *l*	*Wittstock.*
Havel,	*Rathenau*, Brandenburg, Potsdam, Spandau, Neu-Strelitz.
Rhin,	Ruppin.
Nuthe, *l*	Luckenwalde, Jüterbogk.
Spree, *l*	Berlin, Charlottenburg, Kottbus, *Spremberg*, Bautzen.
Ihle,	Burg.
Ohre, *l*.,	*Neu-Haldensleben.*
Nathe,	Zerbst.
Saale, *l*	*Kalbe*, Bernburg, Halle, Merseburg, Weissenfels, Naumburg, *Jena*, Rudolstadt, Hof.
Bode, *l*	Quedlinburg.
Holzem-me,	Halberstadt.
Fuhne,	Köthen,
Wipper, *l*	Aschersleben,
Böse, *l*	Eisleben.
White Elster,	Merseburg, Leipsic, Zeitz, Gera, *Ronneburg*, Greitz, Plauen.
Pleisse,	Altenburg, Schmöllin, Crimmitzchau, Werdau.
Goltsch,	Reichenbach.
Unstruth,	*Langensalza*, Mühlhausen.
Helme, *l*	*Sangerhausen*,
Zerza, *l*	Nordhausen.
Wipper, *l*	Sondershausen.
Gera,	Erfurt, *Arnstadt.*
Leina,	Gotha.
Ilm, *l*	Weimar.
Mulde, *l*	Eilenburg, *Grimma*, Glauchau, Meerane, Zwickau, *Lössnitz.* *Schneeberg.*
Münz-bach,	*Dobeln*, *Rosswein*, *Nossen*, Freiberg.
Zschopau, *l*	*Mittweida*, *Hainichen*, *Frankenberg*, *Zschoppau.*
Chemnitz,	Chemnitz, Annaberg.
Black Elster,	Wittenberg,
Roda, *l*	*Grossenhain.*
Pulnitz,	Leipa.
Eger, *l*	*Leitmeritz*, *Saatz*, Eger.
Moldau, *l*	Prague, Budweis.
Beraun, *l*	Pilsen, *Marienbad*,
Bradawka,	*Klattau.*
Czidlina,	*Gitschin.*
Isar,	*Jungbunzlau.*
Chrudimka, *l*	*Chrudim.*
Lauchna, *l*	*Leitomischel.*
Weser and Werra,	Bremen, *Nienburg*, Minden, *Hameln*, *Minden*; *Eschwege*, *Schmalkald* n., Meiningen, *Hildburghausen.*
Hunte, *l*	Oldenburg.
Berne,	*Berne.*
Aller,	Celle, *Helmstadt*,
Leine, *l*	Hanover, *Eimbeck*, Göttingen.
Innerste,	Hildesheim.
Ruhine,	*Nordheim.*
Soze,	*Osterode.*
Ocker, *l*	Brunswick, *Wolfenbüttel*, *Goslar.*
Zellerbach,	*Klausthal.*
Aue,	Bückeburg.
Werre, *l*	Herford, Bielefeld, Detmold.
Diemel, *l*	Arolsen,

Basins inclined to the North Sea (continued).

Rivers.	*Towns.*
Fulda, *l*	Cassel, Hersfeld, Fulda.
Hörsel,	Eisenach.
Hasel,	*Suhl*, n.
Co. of E. Friesland,	*Norden.*
Ems,	Emden, *Leer.*
Haase,	Osnabrück.
Ahe, *l*	MÜNSTER.
Hunse,	GRÖNINGEN.
Hoorn Diep,	ASSEN.
Vecht,	*Enscheda.*
Zwarte,	ZWOLLE.
Reest,	*Meppel.*
Rhine,	Kampen, *Raalte*, Deventer, Zutphen, AMSTERDAM, Leyden, UTRECHT, ARNHEIM, Gouda, *Gorkum*, *Thiel*, Nimeguen, *Emmerich*, *Cleves*, n., Wesel, Crefeld, n., Düsseldorf, Neuss, Solingen, n., Mülheim, COLOGNE, Bonn, *Neuwied*, Coblentz, *Bingen*, Mayence, Worms, Mannheim, Speyer, Germersheim, CARLSRUHE, STRASBOURG, BASLE, SCHAFFHAUSEN, *Constance*, VADUZ, COIRE.
Lippe,	*Hamm*, *Lippstadt*, Paderborn.
Söster-bach,	Söst.
Ruhr,	Duisburg, Mulheim, Bochum, n., Essen, n., *Arensberg.*
Emster,	Dortmund.
Baaren-bach, *l*	Iserlohn.
Wipper,	Remscheid, n., Solingen, *Ronsdorf*, Elberfeld, Barmen.
Lennep, *l*	*Lennep.*
Sieg,	*Siegen.*
Nette, *l*	*Mayen.*
Moselle, *l*	Coblenz, Treves, *Thionville*, METZ, *Pont-à-Mousson*, Nancy, *Toul*, EPINAL, *Remiremont.*
Lahn,	Giessen, *Marburg.*
Nahe, *l*	Kreuznach.
Glan,	Kaiserslautern, n.
Salzbach,	WIESBADEN.
Main,	Mayence, Frankfürt, Offenbach, HOMBURG, n., Aschaffenberg, Hanau, Würzburg, *Kissingen*, *Schweinfurt.*
Nedda,	HOMBURG, n.
Tauber, *l*	*Rothenburg.*
Regnitz, *l*	Bamberg, Erlangen, Fürth, Schwabach.
Pegnitz,	Nürnberg.
Rezat,	Anspach.
Itz,	COBURG.
Red Mayn,	Baireuth.
Darm,	DARMSTADT.
Weschnitz,	*Weinheim.*
Necker,	Mannheim, Heidelberg, Heilbronn, Ludwigsburg, *Cannstadt*, Eslingen, *Kirchheim*, *Tübingen*, Reutlingen, n., *Rottenburg.*
Kocher,	*Hall.*
Ens, *l*	Pforzheim.
Rems,	*Gmünd.*
Nesenbach, *l*	STUTTGART.
Fils,	*Göppingen.*
Eschatz,	Reutlingen, *Ehningen.*
Starzel,	Hechingen.
Speyer, *l*	Speyer, *Neustadt-an-der-Haardt.*
Salzbach,	*Bruchsal.*
Queich, *l*	Landau.
Murg,	Rastadt.
Oosbach, *l*	*Baden-Baden.*
Moder, *l*	Haguenau, *Bischwiller.*
Zorn, *l*	*Saverne.*
Kinzig,	*Lehr*, n.
Ill, *l*	STRASBOURG, *Schelestadt*, COLMAR, Mühlhausen.
Liepvrette, *l*	St Marie-aux-Mines.
Thur, *l*	Muhlhausen, *Thann.*
Elz,	Freiburg, n.
Ergolz, *l*	LIESTHAL.
Aar, *l*	AARAU, SOLEURE, BERNE.
Limmat,	ZURICH, *Wädenschwyl.*
Linth, *l*	GLARUS.
Reuss,	LUCERN, ALTORF.
Lorze,	ZUG.
Sarner Aa, *l*	SARNEN.
Engelberg Aa, *l*	STANZ.
Muota,	SCHWYTZ.
Emmen,	SOLEURE, *Langnau.*
Thiele, *l*	BIENNE, NEUFCHATEL.
Sarine, *l*	FREYBURG.
Toess, *l*	*Winterthur.*
Thur, *l*	FRAUENFELD, n.
Sittern,	*Herisau*, APPENZELL.
Steinach, *l*	ST GALL.

Basins inclined to the Black Sea.

Rivers.	*Towns.*
Danube,	Baba-Dagh, Tultcha, Kilia, Ismail, *Isaktchi*, *Reni*, Galacz, Braila, *Hirsova*, *Rassova*, Silistria, *Oltenitza*, *Giurgevo*, Rustchuk, Sistova, Nicopoli, Widdin, Semendria, Pancsova, n., BELGRADE, Semlin, Peterwardein, Neusatz, *Apatin*, Zombar, n., Mohacs, Funfkirchen, n., Baja, *Kalocsa*, *Paks*, *Solt*, Földvar, *Duna-Vecze*, Pesth, BUDA, Alt-Ofen, Waitzen, Gran, *Dorog*, Komorn, Pressburg, VIENNA, Linz, Passau, Straubing, Ratisbon, Ingolstadt, *Neuburg*, Ulm, *Tuttlingen*.
Pruth, *l*	Czernowitz, Snlatyn, Kolomea.
Baglui,	JASSY.
Sereth, *l*	Galacz, *Baku*, Roman.
Milkov,	*Foktchany*.
Jalomnitza, *l*	*Tergovist*.
Lom,	*Rasgrad*, n.
Argish, *l*	BUCHAREST, n.
Jantra,	Tirnova.
Alt, *l*	Kronstadt, n.
Zibin,	Hermannstadt.
Isker,	Sophia.
Schyl, *l*	Krajova.
Harasch, *l*	Versetz, n.
Morava,	Semendria, n., *Passarovicz*.
W. Morava, *l*	*Karanovacz*.
Ibar,	Novi-Bazar, Pristina, Kossova.
Nissawa,	Nissa or Nisch.
Karasch, *l*	Versetz, n.
Temes, *l*	Pancsova, TEMESWAR, *Lugos*.
Save,	BELGRADE, *Mitrovitz*, AGRAM.
Drina,	Zvornik.
Bosna,	BOSNA-SERAI, n.
Posega, *l*	*Posega*.
Verbas,	*Banialuka*.
Unna,	*Dubicza*, *Novi*.
Kulpa,	*Karlstadt*.
Laybach,	LAYBACH.
Theiss, *l*	Nagy-Kikinda, Zenta, Theresienstadt, Szegedin, Vasarhely, Szentes, Felegyhaza, n., Keszkemet, n., Nagy-Körös,

Rivers.	*Towns.*
Theiss—*continued.*	n., Nyiregyhaza, Czegled, Szolnok, *Miklos*, *Tokay*, *Szigeth*.
Alt-Bega, *l*	Becskerek.
Maros, *l*	Szegedin, Arad, *Lippa*, Mako, *Karlsburg*, Maros-Vazarhely, *Szasz-Regen*.
Aranyos,	*Thorda*.
Körös, *l*	Szarvas, Bekes, Czaba, Gyula.
Berettyo,	Mezö-Tur, Kardzag.
Sebes-Körös,	Böszörmeny, Grosswardein.
Zagyva,	Gyongyos, n.
Erlau,	Erlau.
Koselo,	Debreczin, Szoboszlo.
Hernad,	Kaschau, *Iglo*, *Leutschau*.
Sajo,	Miskoltz, *Rosenau*, *Schmölnitz*.
Tarcza, *l*	*Eperies*.
Bodrog, *l*	*Ujhely*, n., *Munkacs*, n.
Szamos, *l*	Szathmary, KLAUSENBURG.
Kraszna, *l*	*Nagy-Karoly*.
Lapos,	*Nagy-Bany*.
Szamos,	*Bistritz*, n. (on the Bistritz).
Drave,	Essek, *Warasdin*, *Bleibach*.
Mur, *l*	GRÄTZ.
Glan,	Klagenfürt.
Sarvitz,	*Szexard*, Stühlweissenburg.
Kapos,	*Keszthely*.
Sed,	Veszprim.
Gran, *l*	*Gran*, Schemnitz, n., *Kremnitz*, n., *Neusohl*.
Waag, *l*	Komorn, *Tyrnau*.
Raab,	Raab, Papa, n.
Leitha, *l*	Neustadt.
Torna,	Vasarhely-Somlo.
Raabnitz,	Oedenburg, n.
Guns, *l*	*Guns*.
March or Morava, *l*	Pressburg, Olmütz, Sternberg, n.
Thaya,	*Nikolsburg*, n., *Znaym*.
Schwartza, *l*	Brünn.
Iglawa,	Iglau.
Litta,	*Austerlitz*.
Miava, *l*	*Miava*.
Rumsa,	Prossnitz.
Trasen,	*St Polten*.
Enns,	Steyer.
Inn,	Passau, INNSBRÜCK.
Salza,	Salzburg.

Basins inclined to the Black Sea (continued).

Rivers.	*Towns.*	*Rivers.*	*Towns.*
Isar,	Landshut, *Freising*, MUNICH.	Wornitz, *l.*	*Dinkelsbühl.*
Naab, *l.*	Amberg, n.	Eger,	*Nördlingen.*
Alt Mühl,	*Eichstadt.*	Iller,	Ulm, Kempten.
Lech,	Augsburg.	Aach,	*Memmingen.*

Basins inclined to the Adriatic.

Isonzo,	See under "Italy."	Kerka,	Knin.
Gulf of Trieste,	Trieste, *Capo d'Istria*, *Pirano.*	Cicola, *l.*	*Dernis.*
		Cettina,	Sign.
W. co. of Istria,	Rovigno, Pola.	Narenta,	*Gabella*, MOSTAR.
Gulf of Fiume,	Fiume.	Bistritza,	Imoschi, n., *Livno.*
Morlacca Chan-nel,	*Zengg.*	Tribinschucza,	Trebigno.
Co. of Dalmatia,	ZARA, Bencovas, n., Setia,	W. co. of Dalmatia,	Ragusa, *Castelnuovo.*
	benico, Spalatro.		

Lakes.—In the basin of the Danube are *Balaton* or *Platten See* and *Neusiedler See*, in the west of Hungary;* *Traun See* and *Atter See*, in Upper Austria; *Wörth See* and *Weissen See*, in Carinthia. The Isonzo drains *Lake Zirknitz*, in Carniola.

Climate.—The climate differs very greatly in the different provinces, but the entire empire is comprised between the isotherms of 50° and 60° Fahr. The mean annual temperature of Vienna, in the centre of the Austrian dominions, is 51°.45, winter 32°, and summer 69°.4.

German writers divide the empire into three zones—a northern, middle, and southern. The first, which embraces Bohemia, Moravia, Silesia, with the higher parts of Hungary and Galicia—in all, about 70,000 sq. miles—greatly resembles in its average temperature the British Isles and Northern France; wheat, barley, oats, and rye forming the usual crops. This may be called the *zone of grain, hops, and hemp.* The central zone, extending from lat. 49° to 46°, is the zone of *maize, wheat, and the vine*, embracing an area of about 150,000 sq. miles; while the third or southern zone, embracing the part of the empire south of 46°, is that of the *olive, mulberry, figs, and rice.* The line of equal rainfall of 40 to 45 inches proceeds from Lake Garda in the Tyrol, to Trieste, Fiume, and Karlstadt in Croatia; in the Alps it rises to 55, 60, and even to 70 inches; but in Vienna and the low-lying districts 28 inches are a frequent average. Storms are rare in Lower Austria, but in the provinces at the head of the Adriatic they are very frequent and violent. Earthquakes, also, and thunderstorms, are very frequent in the latter region, as well as in Hungary and Transylvania.

Geology and Minerals.—A full half of the empire is covered with tertiary and post-tertiary accumulations, which prevail especially in the basin of the Danube, between the Save and the Carpathian Mountains. Secondary strata occupy extensive areas in the Carnic

* The Hungarian lakes occur in low swampy plains, and are shallow and uninteresting. Those of Salzburg are very small. Zirknitz is remarkable for the periodic disappearance of its waters through apertures in the bottom; in winter it abounds with fish, but in summer its bed is dry and regularly cultivated.

and Julian Alps, in the Carpathians, in the greater part of Dalmatia, Croatia, and Illyria, together with a large belt in the N.W., extending from Vienna to Lake Constance. The palæozoic series are principally confined to the W. of Bohemia, the N. of Moravia, Central Silesia, parts of Tyrol, Upper Austria, and Styria, extending in a long belt from Innsbrück to Neustadt, and in detached patches in Illyria and Croatia. Crystalline rocks prevail in the Eastern Carpathians, and occupy a large portion of the surface of the north-western provinces, especially between Regensburg and Linz on the Danube, to Brünn on the Schwartza. Igneous rocks line the southern flank of the Carpathians, and occur also in Transylvania; and granitic rocks are common in the S.E. of Bohemia and the N. of Upper Austria.

Minerals.—No country in Europe excels Austria in regard to mineral wealth. Almost every valuable kind of mineral is found in inexhaustible quantities. The precious metals are very abundant in Hungary (the only country in which the true opal has been found), Transylvania, and Bohemia; the most celebrated mines being those of Schemnitz and Kremnitz, in North-Western Hungary. Coal, iron, and copper, are abundant in all the provinces. Native steel, more valuable than that made by artificial means, is found in Styria, Carinthia, and Carniola. Tin, so rare in most countries, abounds in Bohemia. A very valuable mine of quicksilver, second only to that of Almaden in Spain, is worked at Idria in Carniola. Lead is found in Carinthia, antimony in Hungary, sulphur and arsenic at Schemnitz. Salt, building-stones of every variety, and precious stones, are widely diffused; and thermal and mineral springs are numerous—the most celebrated being those of Karlsbad, Töplitz, Eger, Sedlitz, and Marienbad, in Bohemia; of Baden in Lower Austria; of Gastein in the Tyrol; and the Hercules baths in the Banat.

Botany and Agriculture.—The portion of Austria situated N. of lat. 46° is embraced within Schouw's second botanical region, or the *region of the Umbelliferæ;* the remainder, consisting of Dalmatia, Croatia, &c., is included within the third or *Mediterranean region* of that naturalist; while the higher elevations of both pertain to his *Arctic-Alpine region*—(see under "Europe"). The total number of indigenous plants in the empire has not been ascertained, but the whole of Germany, using the term in its widest acceptation, is said to contain 7000 species, of which 2566 are flowering-plants, subdivided into 529 monocotyledons and 2037 dicotyledons. The vegetation of the empire is therefore very extensive and varied, that of Hungary alone embracing nearly all the plants indigenous to Europe, with many others that have been imported. About a fourth part of the entire surface is covered with forests. The Alps and Sudetic Mountains produce the pine, birch, and larch; the Carpathians, firs, pines, and beeches; while the magnificent forests of the Hungarian and Polish provinces consist for the most part of the oak, beech, and elm. The trees attain in many places a gigantic size; and the timber, which is of excellent quality, and well adapted for house and ship building, is largely exported.

Agriculture.—Though the soil is characterised by great diversity, it is

for the most part highly fertile; and notwithstanding the antiquated and unskilful methods employed in husbandry, the crops are rich and abundant. In the vicinity of the large rivers the soil consists of a black vegetable mould, which is admirably suited for the growth of wheat. In some parts of Hungary no manure is required for the production of the choicest crops. It is estimated that about one-third of the whole surface is under tillage. In the northern provinces, the usual cereals raised are wheat, buckwheat, rye, oats, and barley; in the central provinces, maize and wheat; while in the southern are maize and rice. The Banat, Hungary, and Galicia, are the principal corn-growing provinces, and rye forms everywhere the chief food of the people. Vines, hops, tobacco, saffron, flax, hemp, and a great variety of fruit-trees, are also cultivated; and mulberry-trees, for silk-worms, are extensively grown in Dalmatia and Hungary. Vineyards occupy about half a million acres of the surface, and yield between 4 and 5 million hhds. of wine annually. The parts of the country best adapted for the culture of the vine are Styria, Lower Austria, and the N.E. of Hungary; but the wines are of inferior quality, except those produced in the upper basin of the Theiss, especially those of Tokay, which have been long celebrated for their excellence. The vine cannot be cultivated at a higher elevation than 1750 feet; the oak extends to the height of 3000 feet, the cereals generally to 4500 feet, pines to 6000 feet, and pasture to the limit of perennial congelation, which in the Alps is at a height of 8900 feet. Pasture-lands are limited in extent, save in the Alpine provinces and Moravia, where cattle are numerous and the produce of the dairy considerable. In Hungary and Galicia great attention is paid to the rearing of sheep, horses, and cattle; great quantities of wool are exported from the Buckowina; and goats, swine, and poultry from most of the provinces. The oil of Southern Illyria is superior to that of Spain and Italy.

Zoology.—The fauna of Austria is, in general, the same as that of Germany, and the remainder is common to Italy and European Turkey. Of the 78 species of Mammalia inhabiting Central Europe, 41 are carnivora, 22 rodentia, 9 ruminantia, and 1 pachyderm. The following are the principal species:—the bear, wolf, fox, lynx, and chamois, in the Alps and Carpathians; the marten, otter, marmot, beaver, wild-boar, wild-cat, jackal, stag, deer, hare, and rabbit, in Dalmatia. Of the 305 species of birds belonging to the same zoological province, the eagle, vulture, hawk, and other birds of prey, are common in the mountains; and the pheasant, wild-duck, white heron, and game of all kinds, in the plains. Canaries are reared in great numbers in the Tyrol, whence they are largely exported. Among the 31 reptiles the most remarkable is the *Proteus anguineus*, an animal resembling the water-lizard, found in Lake Zirknitz in Carniola. Fishes are abundant in most of the rivers, especially in the Theiss and Lower Danube, where the sturgeon and pike attain to a vast size. The fresh-water fishes of Carniola alone amount, according to Freyer, to 32 species. The marine species, which include the mackerel, tunny, and anchovy, are embraced within Forbes's 'Mediterranean Region of Marine Life,' which also embraces the Black Sea. A pearl-bearing mollusc inhabits the waters of Hungary, Bohemia, and the Archduchy of Austria, and a regular pearl-fishery is established on the Vatava. Insects are abundant

in the low marshy grounds of Hungary, especially gnats and flies; bees, Spanish flies, and the cochineal insect, are reared in great numbers; leeches are numerous on the Neusiedler See, and are largely exported for medicinal purposes; and corals are collected on the coast of Dalmatia.

Ethnography.—The people of Austria comprise four great races, which, in 1869, existed in the following proportions,—viz., Sclavonians, 16,200,000; Roumans (including Italians and Wallachians), 3,450,000; Germans, 9,040,000; Magyars, 5,430,000; Jews, Gypsies, and other races, 1,354,000. The Sclavonians form the majority in Bohemia, Moravia, Silesia, Illyria, Dalmatia, and Hungary, and constitute almost the entire population of Galicia. The Roumans, or people speaking Romannic languages, are numerous in the southern part of the Tyrol and the maritime districts of Illyria and Dalmatia. The Germans predominate in Styria and the Tyrol, are very numerous in Bohemia, and are almost the sole inhabitants of Upper Austria, Lower Austria, and Salzburg. The Magyars are the dominant race in Hungary and Transylvania. The Jews are most numerous in the towns of Galicia, Bohemia, Moravia, and Hungary; and the Gypsies, Armenians, and Greeks, are scattered over all the eastern provinces of the empire.

Language.—The languages spoken in this extensive empire belong to four distinct families—viz., the Sclavonic, Teutonic, Greco-Latin, and Finno-Tartarian. To the first belong the *Russniak*, spoken by the Sclavonian population of Galicia and Hungary; the *Servian*, in parts of Dalmatia, Sclavonia, and Military Croatia, where it forms the vernacular of about 1,800,000; the *Bohemian* or *Tchekhian*, spoken by from 3,000,000 to 4,000,000 of the population of Bohemia and Moravia, the *Slowak* or *Slovakian*, by about 1,800,000 in the N.W. of Hungary. The Slowaks are descendants of the original Sclavonic settlers in Hungary, who, in 894, were conquered by the Magyars; but though a subjugated race, they still retain their original language, as a remnant of their ancient national existence. The second or Teutonic family of languages is represented by the *German*, which is the language of the Court and of literature, and is spoken by nearly 9,000,000 of the population, who reside for the most part in the nine German provinces, and especially in the Archduchy of Austria, Salzburg, Styria, and the Tyrol.—(See under "Germany," where the literature will also be found.) The Greco-Latin family is mainly confined to the coasts of the Adriatic, and is represented by three languages—viz., the *Italian*, in the south of the Tyrol; the *Wallachian* or *Duco-Romana*, in the south of Transylvania, into which it has spread from the Turkish provinces of Wallachia and Moldavia; and the *Albanian* or *Arnaute*, the remains of a language long extinct, and which formed an intermediate link between several distinct families, in the southern parts of Dalmatia. The Arnauts differ in language and physical conformation from all the other nations of Europe, and are supposed to be descended from the ancient Illyrians. The Finno-Tartarian family is represented by the *Magyar* or *Hungarian*, which is spoken by 4,820,000 of the population of Hungary—the remainder consisting of Slowaks, Croatians, Germans, Russniaks, Wallachians, and Jews. The Magyars are a people of Finnish extraction, and closely allied to the Ostiaks and Woguls, barbarous hordes who lead a wandering life in the upper and central basin of the

Obi. They entered Europe in the ninth century, and subdued Hungary in the short space of ten years; and though then differing in few or no respects from the other savage tribes of Central Asia, they now take rank among the foremost nations of Europe in physical, moral, and intellectual qualities. Their language has experienced a similar transmutation, from its long-continued contact with European civilisation; but it still retains those well-marked features which have always characterised the Finnish branch of the linguistic family to which it belongs. For example, the Magyar resolves its vowels into two classes, one of which (a, o, u) denotes the masculine, and the other (e, i, ö, ü) the feminine: and the individual words of the language are so formed that a masculine and a feminine vowel are never allowed to meet in the same vocable, whether simple or compound. This curious characteristic of the Finnish dialects strongly reminds the Celtic scholar of the well-known principle, *leathan ri leathan is caol ri caol;* or "broad to broad, and small to small."

Religion.—According to the 'Almanach de Gotha' for 1870, the different religious persuasions in the empire contained the following numbers in 1864: Roman Catholics, 23,265,000; Greek Catholics, 3,861,000; Protestants (chiefly Reformed), 3,495,000; Jews, 1,121,000; Unitarians and other sects, 63,000. The Protestants are chiefly found in the Hungarian provinces; about half the Magyars are Calvinists, and a large proportion of the remainder Lutherans, who are also numerous in the German provinces. The adherents of the Greek Church are most numerous in Galicia, where they amount to upwards of 2,000,000; but they are found in considerable numbers in all the eastern provinces.

Education.—Of late years education has made rapid advances throughout the empire, though it is still far behind Prussia. In the German provinces primary schools are numerous and efficient, but in the southern and eastern provinces a great obstacle to efficiency is presented by the different languages spoken by the pupils, there being sometimes no fewer than three or four in a single school. The law requires that every child between the ages of six and twelve shall be educated either in school or at home; while in the manufacturing districts no child is allowed to be sent to a factory before completing his ninth year, and even then he is obliged to attend classes twice a-week until fifteen years of age. In some parts of the empire marriage is prohibited until the parties can prove their ability to read, write, and cipher. There are eight universities in the empire—viz., at Vienna, Prague, Grätz, Olmütz, Innsbrück, Lemberg, Cracow, and Pesth. The number of students attending these, in 1860, was 8256, one-fourth of whom belonged to the University of Vienna, which is the seat of the most famous medical school in Germany.

Government, Army and Navy, Revenue, &c.—The form of government is an hereditary, and, in some respects, a constitutional monarchy. Previous to the late war with Prussia, the Emperor of Austria was all but absolute in his own dominions, and also occupied the first rank in the Germanic Confederation. As the result of that war, he is wholly excluded from taking part in the political affairs of North and South Germany, and has been obliged greatly to augment the liberties of his own subjects. The entire empire now forms a sort of double state, one half consisting of the German provinces, or Austria Proper, and the other of the Magyar or Hungarian

provinces. Each of these divisions has its own parliament, laws, ministers, and government, but are united into one whole by the emperor, and by a common parliament, named the Delegations, consisting of 120 members, chosen in equal numbers by the two grand divisions of the empire. All matters affecting the common interests of the two sections—especially foreign affairs, war, and finance—come under the jurisdiction of this body. *Army and Navy.*—In August, 1869, the total number of troops, on the peace footing, numbered 390,705, with 42,200 horses. The navy consisted of 39 steamers, carrying 639 guns, with 11,730 horse-power, together with 20 sailing vessels, with 145 guns. Austria also possesses 24 fortresses, many of them of great strength. The *Revenue*, in 1868, amounted to £48,241,000; the *Expenditure*, to £50,438,000; and the *Public Debt*, to £302,531,000. About a third of the entire revenue is derived from direct taxes on land, houses, industry, and income, and the remainder from indirect imposts, the chief items being customs, and the duties on salt, timber, and tobacco. The public debt is advancing at a rate which threatens national bankruptcy. In 1846 it was only £103,000,000; in 1856, £241,207,000; while it is now £302,531,000.

Commerce, Manufactures, Exports, and Imports.—The foreign commerce of Austria is comparatively unimportant, the sole outlets being Trieste and Fiume on the Adriatic, and Constantinople and Trebizond on the Black Sea, to which the only access is by steam navigation on the Danube. The inland trade, however, is very considerable, the empire, owing to its vast dimensions, being comparatively independent of other countries. In 1868, the number of merchant vessels that entered the port of Trieste was 11,056, carrying 1,006,211 tons; cleared, 10,956 vessels, carrying 1,052,068 tons. The total value of the imports of the empire in 1867, excluding bullion, amounted to £27,628,031, and the exports to £40,085,568. Nearly two-thirds of both exports and imports is carried on with North and South Germany. Austria's next best customer is Turkey, which sends into the empire about £3,000,000 worth of goods annually, and receives Austrian exports to the value of above £5,000,000. Italy, Russia, and the United Kingdom follow next in order, but at a great distance. The principal commodities exported from Austria to the British Isles are corn, flour, hemp, tallow, glass beads, olive-oil, wine, quicksilver, currants, cream of tartar, lard, seeds, shumac, sponge, wood, and wool; while our chief exports to Austria are cotton and woollen manufactures, averaging annually about £350,000. Very little Hungarian wine finds its way to British ports, though, as a wine-producing country, Austria is second only to France. The manufactures of the empire are mainly confined to the German provinces, and especially to Bohemia and Moravia. The former is celebrated for its linen, cotton, and woollen fabrics, and still more for its manufacture of glass. Moravia is also much engaged in the woollen industry, and has, in Brünn, the second largest manufacturing town in the empire. The capital, however, is the great seat of

the manufacture of articles of taste, as jewellery, glass, carriages, porcelain, silk, and books. Hungary is very largely engaged in the production of wine and the metals. Mining also forms an important branch of industry in Bohemia and the mountainous parts of Upper Austria, Styria, and Carinthia. Wooden articles are executed with much ingenuity in the Tyrol, while leather and linen goods are produced in all parts of the empire.

Internal Communication.—The Danube, with its navigable tributaries the Theiss, Save, and Drave, is the great commercial thoroughfare of the empire. The current of the main river is so rapid that steamers alone are now employed. Steamers are also extensively used on the other navigable rivers and lakes. The total extent of river navigation in the empire is estimated at 4300 miles. There are few *Canals*, except in lower Hungary.

RAILWAYS have made great progress, and connect the capital with the most distant points of the empire. In 1859, 2086 miles were open for traffic; and in 1869, no fewer than 4807 m., embracing the following principal lines: Vienna to Brünn, Olmütz, and Prague, and thence to Dresden and Berlin. Vienna to Troppau, Cracow, Lemberg, and Czernowitz. Vienna to Pressburg, Pesth, Szegedin, and Temeswar; with a branch from Czegled to Grosswardein, Debreczin, and Tokay. Vienna to Raab, Komorn, Stühlweissenburg, and Warasdin. Vienna to Grätz, Cilly, Laybach, and Trieste; with a branch from Cilly to Agram. Vienna to Linz, and thence to Ratisbon and Innsbrück. Another important line traverses the Tyrol from Munich, in Bavaria, through the Brenner Pass, to Verona and Venice. Excellent *carriage-roads* have also been constructed at great expense between all the leading cities of the empire. That from Pavia in Italy to Czernowitz in Galicia, 1120 miles in length, is carried across rivers and mountain-chains, and is macadamised throughout. Similar roads connect the capital with Prague, Buda, Trieste, and Milan. Upwards of sixty *mountain-passes* have been rendered practicable for wheeled carriages, at an enormous expense. The principal of these are enumerated above, see p. 261.

SWITZERLAND.

Position and Boundaries.—N., Lake Constance and Grand-duchy of Baden; W., France; S., Italy; E., the Tyrol. Lat. 45° 50′—47° 50′ N.; lon. 5° 55′—10° 30′ E.

Bern, the federal capital, is nearly on the same parallel with Nantes, Grätz, Jassy, Azov, and Astrakhan; and nearly on the same meridian as the Naze, Münster, Strasbourg, and Turin. The general outline is elliptical; greatest length from E. to W., 216 miles; extreme breadth, 140 miles. The surface is more mountainous than in any other country in Europe, two-thirds of the whole being occupied with lofty mountain-chains, and the remaining third consisting of an elevated plateau, about 1300 feet above the level of the sea, and studded with many beautiful lakes. This plateau forms an elongated, undulating plain, crossing the country from S.W. to N.E., with a length of about 140 m., and an average breadth of between 20 and 30 m.

Area and Population.—The area of the Confederation amounts to 15,716 sq. m., being a little more than the half of Scotland; while the population, in 1860, was 2,510,494, or five-sixths of the population of Scotland, being 152 persons to each sq. m.

Political Divisions.—Switzerland is divided into twenty-two cantons, which comprise, however, twenty-five distinct states, three of the cantons—Basle, Appenzell, and Unterwalden—being subdivided into two states each. There are seven western cantons; twelve north-eastern, including the four forest cantons of Schwytz, Lucern, Unterwalden, and Uri; and three southern cantons.

SEVEN WESTERN CANTONS.

Geneva.—GENEVA 41 (Rhone), Carouge 6 (Arve).

Vaud.—LAUSANNE 21, Vevay 6 (Lake of Geneva).

Fribourg.—FRIBOURG 10 (Sarine), *Morat* (Lake Morat).

Neuchâtel.—NEUCHATEL 10, Vallengin 6 n. (Lake Neuchâtel), Chaux-de-Fonds 17 n., Locle 8 n. (Doubs).

Bern.—BERN 29, Thun 4 (Aar), Bienne 6 (Lake Bienne), Langnau 5 (Emmen), *Laupen* (Sarine).

Soleure.—SOLEURE 5, Olten 2 (Aar).

Basel.—BASLE or BÂLE 38, cap. of Bâle Ville (Rhine); Liesthal 3, cap. of Bâle Campagne (Ergolz).

TWELVE NORTH-EASTERN CANTONS.

Aargau.—AARAU 5 (Aar), Baden 3 (Limmat).

Zurich.—ZURICH 18, Wadenschwyl 5 (Limmat), Winterthur 7 (Toess).

Schaffhausen.—SCHAFFHAUSEN 9 (Rhine).

Thurgau.—FRAUENFELD 2 (Murg).

St Gall.—ST GALL 15 (Steinach), *Sargans*, *Pfeffers* (Rhine).

Appenzell.—APPENZELL 3, cap. of Inner Rhoden, Herisau 3 n. (Sittern), Trogen 3, cap. of Ausser-Rhoden (Goldach).

Glarus.—GLARUS 5, *Näfels* (Linth).

Schwytz.—SCHWYTZ 6 (Muota), *Morgarten* (L. Egeri).

Zug.—ZUG 4 (Lorze).

Lucern.—LUCERN 11 (Reuss), *Sempach* (L. Sempach).

Unterwalden.—STANZ 2, cap. of Nidwalden (Engelberg Aa), Sarnen 3, cap. of Obwalden (Sarner Aa).

Uri.—ALTORF 2, *Bürglen*, n. (Lake Lucern).

THREE SOUTHERN CANTONS.

Grisons.—COIRE or CHUR 7 (Rhine), *Bernhardin*, *Splügen*.

Ticino or Tessin.—BELLINZONA 2, Locarno 3 (Ticino), Lugano 5 (Lake Lugano).

Valais.—SION OR SITTEN 4, *Martigny*, *Leuk* (Rhone).

Descriptive Notes.—The towns are remarkably few in proportion to the population, there being only four (Geneva, Bern, Bâle, Lau-

sanne), which exceed 20,000, and six (Neufchâtel, Chaux-de-Fonds, Zurich, St Gall, Lucern, Fribourg) between 20,000 and 10,000.

Geneva, finely situated on the Rhone, where it issues from the lake, is the largest city in Switzerland; noted for its manufacture of watches and jewellery; has a Protestant college, and contains the federal arsenal. The names of Calvin, Beza, Knox, Cranmer, Lesage, Deluc, Lefort, Rousseau, Necker, Saussure, and De Candolle adorn the annals of this famous city. **Lausanne**, on the Lake of Geneva, in the midst of enchanting scenery, has several manufactures, and numerous educational institutions. **Fribourg**, a busy manufacturing town on the Sarine. **Neuchâtel**, or **Neufchâtel**, on the lake of same name, is a place of great trade, especially in wine, corn, cattle, and watches; has a college, and a cathedral where the doctrines of the Reformation were preached as early as 1530. **Chaux-de-Fonds**, like Geneva, is noted for its manufacture of watches. **Bern**, the seat of the federal diet, and therefore usually regarded as the capital of Switzerland, pleasantly situated on the Aar, and in population inferior only to Geneva; has a university, founded in 1834; a public library, containing numerous books and MSS. on Swiss history; numerous manufactures, especially of gunpowder, firearms, mathematical instruments, straw-hats, paper, and leather; the birthplace of Haller the poet. **Thun** (pronounced Toon), on the Aar, near where it issues from the lake, is renowned for its romantic situation. **Soleure**, a small town on the Aar, with a college, a public library, and botanic garden; here Kosciusko died in 1817. **Basle** or **Bâle** (*Ger.* Basel), a celebrated and ancient city on the Rhine, near its great bend. It dates from the fourth century, and in the eleventh was the most powerful city in Helvetia; it was the seat of a great council (1431-1437), and of a memorable treaty between France and Prussia in 1795: it is now the third city in the confederation in point of population; contains a university, and numerous manufactures of silk ribbons: the birthplace of Euler and Bernouilli, the celebrated algebraists, and of the two Holbeins: here also Erasmus died in 1536. **Zurich**, the Athens of Switzerland, contains a university; has important manufactures of silk and cotton fabrics: here Zwingle preached, and here the first entire English version of the Scriptures (Coverdale's) was printed in 1535; it is the birthplace of Gessner, Lavater, and Pestalozzi. **Schaffhausen**, on the Rhine, near its picturesque falls, has a college, and several manufactures. **Frauenfeld**, a small town on the Murg, with cotton-mills and dye-works. **St Gall**, **Appenzell**, and **Herisau**, have extensive manufactures of muslin and of silk and cotton fabrics. **Glarus** exports cheese in great quantities, and has printing and dyeing works. **Lucern**, the cap. of Catholic Switzerland, is celebrated for its beautiful scenery, and has a lyceum with 14 professors. **Altorf**, famous for the resistance of William Tell to the tyrant Gessler, in 1307. **Coire** (*Fr.* Chur), in the valley of the Upper Rhine, has an active transit-trade and some manufactures.

Mountains.—Switzerland is by far the most mountainous country in Europe, and the one which contains the grandest scenery. There are three principal ranges:—

The *Pennine Alps*, in the S.W., between Switzerland and Piedmont, and between the basins of the Rhone and Po, contain Mont Blanc, in Savoy, the loftiest summit of the Alps, and now (since 1860) the culminating point of France, 15,781 feet high; Great St Bernard, 11,080

feet; Mont Cervin, 14,705 feet; and Monte Rosa, the culminating point of Switzerland, 15,217 feet: height of snow-line, 8900 feet.

The *Lepontine or Helvetian Alps*, between Switzerland and Lombardy, form the water-parting between the basins of the Rhine, Rhone, and Po: highest summits, the Simplon, 11,510 feet, and Mount St Gothard, 10,900 feet.

The *Bernese Alps*, between the cantons Bern and Valais, and between the Aar and Upper Rhone: highest summits, Jungfrau, 13,672 feet; Schreckhorn, 13,386 feet; Finster-aar-horn, 14,026 feet; the Grimsel, 9700 feet.

Mountain-Passes.—The following are some of the most celebrated passes among the Swiss Alps, arranged in the same order as the mountain-chains:—

1. *Pass of Great St Bernard*, 8173 feet high, leads through the Pennine Alps from Aosta, in Piedmont, to Martigny, in the Valais; traversed by Napoleon with his army in 1800: the Hospice, erected at its highest point, is the most celebrated institution of the kind in all the Alps. 2. The *Cervin Pass*, 10,938 feet high—the loftiest in Europe—leads from Chatillon, on the Dora-Baltea, to Visp, in Canton Valais. 3. The *Simplon Pass*, 6578 feet high, leads from Milan and Domodossola to Canton Valais: it is a great work, executed by Napoleon at prodigious labour and expense; is 38 miles long, 30 feet wide, passes over 611 bridges, and through several extensive tunnels. 4. *Pass of St Gothard*, 6808 feet high, from Bellinzona on the Ticino, to Altorf on the Reuss: it is the only road carried over the crest of the mountains, all the others being conducted through deep gorges and beds of mountain-torrents. It is now a good carriage-way, and has long been a line of great commercial importance. 5. *Pass of Bernhardin*, 7015 feet high, from Bellinzona to Chur, one of the principal routes of commerce between Italy, Switzerland, and Germany. 6. The *Splügen Pass*, 6946 feet high, from Chiavenna in Lombardy to the Grisons, was passed by a French army in 1800, but greatly improved by the Austrian government in 1823, and carried through three covered galleries, which are the longest in the Alps. It has now nearly superseded the *Septimer Pass*, 7611 feet high, which was formerly the ordinary route from Eastern Switzerland into Italy. 7. The *Gemmi Pass*, through the Bernese Alps, 7595 feet high, leading from Canton Bern to Valais, about 24 miles south of Thun. 8. The *Grimsel Pass*, 7126 feet high, through the same chain, at the southern extremity of the Hasli Valley. For the remaining passes across the Alps, see under "Italy" and "Austria."

Glaciers, &c.—The glaciers of the Swiss and Italian Alps are among the grandest and most remarkable phenomena in nature. They consist of huge masses of ice, or of snow that has been partially melted by the heat of summer, but which has afterwards been congealed, and which, quitting the higher level, descend far below the usual snow-limit, into the region of cultivation.

This descent is owing to the inclination of the bed, the annual accumulation of snow during winter in the higher levels, the viscous or semi-fluid character of its structure, and other causes. The rate of motion in the descent is different in different glaciers, according as the elements just specified vary; and it is *continuous*, though not *uniform*, in all, never being wholly arrested, even during the most severe winters. The velocity

increases with the slope, while the surface and central parts move faster than the bottom and sides. One celebrated glacier (Mer de Glace) moves down the sides of Mont Blanc, in summer and autumn, at the rate of 4 feet per day in some parts of its course, while in others it does not exceed 8 or 9 inches. The total number of glaciers in the Alps is estimated at 400, covering an area of 1440 square miles, and forming the sources of several of the largest rivers in Europe, as well as of their principal affluents. Thus, the Rhine and Rhone originate in glaciers of same name, on the opposite sides of Mont St Gothard; and many of the head-waters of the Rhine, Rhone, Po, and Danube find in the glaciers a never-failing supply of water. The principal region of the true glaciers extends from Mount Pelvoux, in Dauphiné, to the Gross Glockner, in the Rhætian Alps, east of which very few occur. Two groups of glaciers are particularly celebrated—one in the Pennine and the other in the Bernese Alps, or Oberland. The first is the *Group of Mont Blanc*, consisting of 34 enormous glaciers, some of which are 20 miles long by 2 broad. It includes the Mer de Glace, covering an area of 18 sq. m., one of the largest glaciers in the Alps, which forms the source of the river Arveiron, about 2 miles above the village Chamouni; and the Glacier de la Brenva, near Courmayeur, one of the most beautiful and most accessible of all known glaciers. The other is the *Group of the Oberland*, in the Bernese Alps, greatly more extensive than the former. It includes the great Aletsch Glacier, which has an area of 32 square miles, and which is fed by the snows of Mont Aletsch; and the Glacier of the Lower Aar, which has been described and repeatedly visited by the celebrated Swiss naturalist, Agassiz.

Avalanches are the most dangerous and terrible phenomena to which the Alpine valleys are exposed. They originate in the higher regions of the mountains, when the accumulation of snow becomes so great that the inclined plane on which the mass rests cannot any longer support it: it then rolls down the declivity by its own weight, acquiring, at every successive leap, both greater dimensions and increased speed, till, arriving at the lower valleys, it covers, destroys, or carries away everything that opposes its course—trees, forests, houses, rocks, and even entire villages.

Waterfalls.—Among the most celebrated waterfalls in Switzerland may be enumerated the following: *Fall of Lausen*, near Shaffhausen, on the Rhine: it has a total descent of 100 feet, and forms one of the most imposing phenomena of the kind in Europe. The *Staub-bach*, in the Lauterbrunnen, Canton Bern, on the White Lutchine, an affluent of the Aar. This is one of the highest falls in Europe, the river projecting itself over a precipice from 800 to 900 feet high. *Fall of Handek*, on the Aar, near the Grimsel glacier. *Fall of Giessbach*, also on the Aar, near Lake Brienz. *Fall of Reichenbach* (a tributary of the Aar), near Meyringen, in the Hasli Valley, and in the S.E. of Canton Bern. *Fall of Tosa*, on the river Toccia, in the Val Formazzo, above Domodossola, noted for its great volume of water. *Fall of Sallenche*, on the Pissevach, an affluent of the Rhone, in Canton Valais, and 10 miles S.W. of Martigny.

Mineral Springs and Baths.—Switzerland contains upwards of 300 mineral springs, 18 bath establishments of the first, and 186 of the second class. Among the most frequented baths are those of Schinznach or Hapsburg on the Aar, and Baden on the Limmat, both in Canton Aargau; of Gurnighel, near Bern; of Leuk, in the Valais; of Lavez, in the Canton de Vaud; Pfeffers, in St Gall; St Moritz, in the Upper

Engadine; Grisons, &c. The first mentioned is chiefly frequented by French visitors: the great bath-house contains 160 baths, 360 beds, and saloons in which 500 persons can dine together: the temperature of the waters is about 60° Fahr. Those of Baden are sulphureous, have a temperature of 117° Fahr., and are chiefly frequented by the Swiss.

Places of Historical Interest.—There are many such in Switzerland, but the following are especially famous:—

Morgarten, on the boundary between Schwytz and Zug, where, on the 15th November 1315, 1300 Swiss defeated an army of 20,000 men, under Leopold of Austria, this being the first battle fought for Swiss independence. In 1798, the Swiss also defeated a French force in the same place. *Tell's Platte*, by the lake of Lucern, where William Tell, the Wallace of Switzerland, escaped from the tyrant Gessler. *Sempach*, on the lake of that name, in Canton Lucern, where, on the 9th July 1386, 1400 Swiss routed 4000 Austrians: the action is rendered memorable by the heroic death of Arnold von Winkelreid, and is celebrated by an annual festival. *Burglen*, in Uri, where Tell was born; and *Altorf*, in the same canton, where he is said to have shot the apple off his son's head. *Morat*, in Fribourg, where the Swiss totally defeated the invading army of Charles the Bold, Duke of Burgundy, 22d June 1476. *Laupen*, Canton Bern, where the Swiss, under Rudolf of Erlach, totally defeated the Austrians, 21st June 1339. *Fraubrunnen*, near Bern, where Enguerrand de Coucy, a French noble, with an army of adventurers, was defeated by the Bernese, in 1375. *Näfels*, where the Austrians, invading Glarus, were defeated, in 1388. *Wildhausen*, in St Gall, where Zwingle was born, in 1484; and *Cappel*, in Zurich, where he was killed in a skirmish against the Catholics, in 1531.

River-Basins.—Switzerland comprises portions of four great river-basins—those of the Rhine, Rhone, Po, and Danube. It is principally embraced, however, in the Rhine basin, which contains an area of 75,000 sq. m., and 21 out of the 25 capitals of Switzerland; while the Rhone basin (in all 37,900 sq. m.) contains only 3, and the Po basin 1 capital. For Tabular View of Rivers and Towns, see "River System of Central Europe," under "Austria," p. 261.

Lakes.—These are more numerous, in proportion to its size, than in any other European country, except Scandinavia and Finland. The two largest are the Lake of Geneva (area 221 sq. m., height above the sea, 1230 feet) and the Lake of Constance (183 sq. m., height above the sea, 1200 feet). They all belong to the same three river-basins as contain the 25 capitals: there are 10 in the basin of the Rhine, viz., *Lake Constance*, or *Boden See*, in the N.E., drained by the main river; *Thun* and *Brienz*, by the Aar; *Zurich* and *Wallenstadt*, by the Limmat; *Zug* and *Lucern*, by the Reuss; *Bienne*, *Neuchâtel*, and *Morat*, by the Thiele. The *Lake of Geneva* is drained by the Rhone; and *Maggiore* and *Lugano* by the Ticino, an affluent of the Po.

Climate.—Owing to the great elevation of the whole country, which is not less than 1300 feet, and the lofty ranges of mountains

which cover the greater part of the surface, the climate of Switzerland is considerably more severe than its geographical situation would indicate. Lying midway between the Pole and the Equator, and in the same latitude as the central parts of France, its climate is far more rigorous and variable, presenting in rapid succession the greatest extremes of temperature and the most violent contrasts of weather. In Geneva, at an elevation of 1230 feet above the sea, the thermometer ranges from 32°.9, the mean in winter, to 62°.95 in summer, while the mean annual temperature of the whole plateau is 4° lower than that of England. The mean pressure of the barometer at Geneva is 27 inches, and the annual fall of rain 29 inches; while on Mont St Bernard, which is 20 miles farther south, the thermometer ranges from 18° to 43° Fahr., the mean height of the barometer being 21 inches, and the fall of rain 65 inches. At elevations of from 1000 to 1600 feet, the climate is pure and healthy; but in the deep and narrow valleys it is usually insalubrious, and *goître*, or Derbyshire neck, as also *cretinism*, are very prevalent. The vine grows in the valleys, and extends to an elevation of 1900 feet; while oranges, olives, and pomegranates come to maturity in the three southern cantons.

Geology.—The Alpine region in the S. consists for the most part of crystalline rocks reposing on a granitic basis: a narrow belt of secondary strata extends N. E. from Martigny, on the Rhone, to Chur on the Rhine, in the line of the Bernese Alps; and another belt from Geneva to Basle, in the line of the Jura Mountains. The elevated plateau, between the Bernese Alps and the Jura Chain, consists of tertiary strata. Palæozoic rocks do not occur.

Minerals.—The mineral products are somewhat numerous, but not extensively wrought: iron, lead, zinc, tin, and copper combined with silver, are found in the Grisons, but the mines are now abandoned. Iron is worked with advantage in the Jura Mountains; coal in Zurich, St Gall, Aargau, and Basle; rock-salt in Vaud; saline and other mineral springs at Berg, and in numerous other localities, as also sulphur, asphalt, gypsum, marble, alabaster, and limestone.

Botany.—The indigenous vegetation is peculiarly rich and varied. The characteristic floras of all countries, from the Mediterranean to the North Pole, are here found arranged in successive belts on the sides of the mountains, as we ascend from the deep sheltered valleys to the snow-clad summits. The following zones of vegetation are easily marked—(1.) The vine-zone, in the valleys, ascending to an elevation of 1900 feet; (2.) Oak, 2600 feet; (3.) The zone of walnuts and chestnuts to 3000 feet; (4.) Beeches, 3200 feet; (5.) Birches, 4500 feet; (6.) Pine forests, spruce, larch, Scotch fir, and dwarf pine, 6000 feet; (7.) Rhododendra, 6500 feet; (8.) Alpine herbs, 7500 feet; (9.) Mosses and lichens, extending to the region of perennial snow, 8900 feet.

Agriculture is well conducted, but the corn raised is not nearly sufficient for home consumption, the deficiency being supplied by importation, and by the extensive use of potatoes and dairy produce. The principal source of wealth is the rich and excellent pastures, which in summer support

vast numbers of cattle, horses, sheep, and goats. Wheat, spelt, oats, barley, buckwheat, flax, hemp, and potatoes, are the principal crops. The vine is cultivated in the valleys; fruit-trees in the northern cantons; the orange, olive, and pomegranate on the Italian frontier.

Zoology.—The Swiss naturalist, M. Fatio, writing in 1869, gives the number of mammals inhabiting Switzerland as 58 species, including a new species of rodent (*mus Poschiavinus*), which feeds on tobacco. The animals have their various habitats in successive zones of elevation (like the plants) along the mountain-sides. The *arvicola nivalis* and Alpine marmot live at a greater altitude than any other European mammal, being found among the oases of rock and herbage, which stand out amidst the vast masses of mountain ice. The falcon and common mouse are met with at an elevation of 11,000 feet; the ermine, 10,000; bear, chamois, steinbok, and frog, 9000; lynx, marten, stag, and golden eagle, 8000; wildcat, hare, mole, bat, and ringed snake, 7000; badger, common viper, newt, and blindworm, 6000; wolf, fox, weasel, fitchet, 5000; lizard, 4000; rabbit, 3000; beaver, 2000; and hamster, 1000.

Ethnography.—The Swiss belong to two distinct races—the Teutonic and the Celtic; the former in the N.E. Cantons, and the latter in the W. and S. The two races are to each other in the proportion of seven to ten—the Germans being the more numerous.

Language.—Four languages (embracing about 60 dialects) are spoken—viz., German in the N. and E., by about 1,745,000 of the population; French in the W., from the frontier to the river Sarine, in Fribourg, by 587,000; Italian in the S., along the Italian frontier, by 135,500; and Romanche in the Engadine, or valley of the Inn, in Grisons, by 42,500. *Religion:* The inhabitants of the table-land and of the N.W. Cantons are nearly all Protestants, who number about 1,476,000. In the eastern and south-eastern cantons the Roman Catholics preponderate—numbering, in the whole Confederation, 1,023,000. The Protestant Church is Calvinistic in doctrine, and Presbyterian in form, but is greatly fettered by state control. *Education* is very widely diffused, especially in the Protestant cantons, where one-fifth of the whole population is constantly attending school; in the Catholic cantons, one-ninth. From the age of 5 to 8, education is compulsory. There are superior gymnasia in all the chief towns; while higher education is provided for by the three universities of Basle, Bern, and Zurich, by the academies of Geneva and Lausanne, and by the federal polytechnic school at Zurich. The university of Basle was founded in 1460. Among its most illustrious professors have been Erasmus, the Buxtorfs, De Wette, and Hagenbach. In regard to *National Character*, the Swiss are a hardy, active, industrious, and temperate people; brave, patriotic, and highly virtuous; but their excessive love of money leads many of them to hire themselves out as soldiers to any foreign power, without very carefully inquiring into the justice of the cause they advocate. In *Literature* their most eminent names are the following:—POETRY: Albert Haller, Solomon Gessner, Bodmer, Salis. HISTORY: Johann Müller, Sismondi. FINE ARTS: The Holbeins, Fontana, Bianchi, Borromini, Hofmann, and John Rudolph Huber, the Tintoretto of Switzerland. SCIENCE: Paracelsus, Euler, the Bernouillis, Haller, Zimmerman, Tissot, Saussure, Charles Bonnet, Pictet, Deluc, De

Candolle, Agassiz. THEOLOGY: Calvin, Beza, Zwingle, Vinet, D'Aubigné. MISCELLANEOUS: Jean Jacques Rousseau, Necker, Madame de Staël, Pestalozzi, Professor Soave, Abbé Fontana, Bonstetten, Dumont, Lavater, Burckhardt.

Government, &c.—The twenty-two Swiss cantons, each of which is an independent state (three of them, indeed—viz., Basle, Appenzell, and Unterwalden—forming 2 states each), constitute a federal republic, united in a perpetual league. This league dates back as far as the year 1307, and at first embraced only three cantons — Uri, Schwytz, and Unterwalden. Other cantons attached themselves at various times afterwards, and it was not until 1815 that the present number was completed. The Federal Assembly, which is composed of two divisions—a National Council, consisting of 128 representatives, being 1 deputy for every 20,000 inhabitants; and a Senate, composed of 44 members chosen by the 22 cantons, being 2 for each —holds its sittings at Bern; and that city is, in consequence, regarded as the federal capital.

Army and Finance.—By an article of the constitution of 1848, the maintenance of a standing army is forbidden; but for the defence of the country all capable of bearing arms are liable to be called out. In 1869, the regular army numbered 84,862 men; the reserve, 50,443; and the "landwehr," 64,243—total 199,548. The receipts in 1868 amounted to £1,054,500; the expenditure to £803,743; and the public debt to £360,000.

Commerce and Manufactures.—The commerce of Switzerland is rather extensive, considering the inland character of the country and the immense mountain-barriers that surround it; but most of the lakes are navigable, and steamers are extensively employed. There are numerous mountain-passes leading from the interior to the southern cantons, and from these into Italy and the Tyrol, which for most part are available not only for beasts of burden but for wheeled carriages. The recent construction of several important lines of railway cannot fail to extend the commerce of the country to an extent hitherto unknown. Basle and Geneva are the entrepôts of the foreign trade; Bern, Zurich, and Lucern, of the internal commerce; while the transit trade, which is very important, is principally enjoyed by Basle, Soleure, Coire, Geneva, Bellinzona, and Lugano. The *Exports* consist principally of cattle, sheep, dairy produce, wine, timber, watches, musical-boxes, jewellery, ribbons, and silk stuffs. The *Imports* are mainly corn, raw cotton, and silk, fine cloth, iron and copper utensils, books, furniture, salt, salted fish, and articles of colonial produce—as tea, sugar, coffee, tobacco. Watches and jewellery are extensively manufactured in the W. cantons; linen in Bern; silks in Zurich and Basle; and cotton goods and embroidery in the N.E. cantons: printing is carried on in Neuchâtel, and printing and dyeing works at Glarus.

Internal Communication.—Several magnificent *roads* lead across the mountain-passes (see p. 274); steamers ply on all the principal lakes; the Aar is navigable from its mouth to Thun, but the Rhine and Rhone do not become navigable till after passing the frontiers of

Switzerland. There are several short *Canals*, one of which connects the Lake of Geneva with Lake Neuchâtel, and another the lakes of Zurich and Wallenstadt. *Railways* have made great progress within the last few years, the following being the principal lines:—That from Yverdun to Lausanne connects the lakes of Neuchâtel and Geneva; a second from Basle proceeds S. to Bern, and S.E. to Lucerne; a third joins this in the E. of Soleure, and proceeds eastward through Aarau, Zurich, and Frauenfeld, to Rheineck on Lake Constance, and thence S. to Pfeffers (in St Gall), Chur, and Bellinzona, with branches to Locarno and Lugano; a fourth connects Winterthur with St Gall, and another important line sets out from Geneva, skirts the lake to Villeneuve, and thence to Martigny, in Valais. In 1858, there were 310 miles of railway open for traffic; but, in 1869, there were 837 m.

ITALY.

Position and Boundaries.—Italy—the central and by far the most interesting of the three great peninsulas of Southern Europe—is bounded on the N. by the Alps, which separate it from the Tyrol and Switzerland; on the W., by France and the Mediterranean; on the S., by the Mediterranean and Ionian seas; and on the E., by the Strait of Otranto, the Adriatic, and Illyria.

Including Sicily, it is comprised between the parallels of 36° 42′ and 46° 42′ N., and the meridians of 6° 35′ and 18° 30′ E., and hence embraces 10° of lat. and 12° of lon. Rome, the ancient capital of Italy, situated almost exactly in the centre of this area (lat. 41° 54′, lon. 12° 59′ E.), is nearly on the same parallel of latitude as Oporto, Saragossa, Ajaccio, Scutari, Adrianople, Sinope, Tiflis, Khiva, Pekin, Great Salt Lake City, Iowa, and New York; and nearly on the same meridian as Copenhagen, Leipzig, Munich, Venice, Tripoli, and St Paul de Loando. The general outline bears a striking resemblance to that of a high-heeled boot, the toe of which approaches Sicily, while the heel is directed against Turkey. The extreme length of the peninsula, from the Alps to Cape Spartivento, is 750 miles; the average breadth is about 110 miles; but between Mont Blanc and the Isonzo it is 330 miles, while at the narrowest part, between Gaeta and Vasto, it is only 80 miles. The coast-line is estimated at 2174 miles; but, except in the S., the shores are but slightly indented. The N.E. coast is low and flat, especially around Venice. The western side of Tuscany and of the Pontifical States is also low and insalubrious, but the remainder of the coast is considerably more elevated.

Area and Population.—Including Lombardy and Venetia, recently acquired from Austria, but omitting Savoy and Nice, now ceded to France, the total area of the peninsula and islands amounts to 114,445 sq. m., or considerably less than the area of the British Isles; while, in 1868, the population was 26,258,339, or about nine-elevenths of that of the United Kingdom. In regard to density of population, the three states of which Italy is composed rank respec-

tively as the fourth, fifth, and sixth in Europe, being only surpassed by Belgium, the Netherlands, and the United Kingdom. Taking the former collectively, there are 228 persons to each sq. m., Lombardy, Venice, and the States of the Church being the most populous, and the old Kingdom of Sardinia the least. The areas and populations of the three different states are as follows :—

	Sq. m.	Pop. (1868).
Kingdom of Italy, . .	109,833	25,527,915
Pontifical States, . .	4,588	723,121
Republic of San Marino, .	24	7,303
	114,445	26,258,339

Political Divisions.—By far the most important of these is the Kingdom of Italy, formed in 1861, and now comprehending almost the whole peninsula, with Sicily and Elba. For administrative purposes the former seven monarchies—Sardinia, Parma, Modena, Tuscany, Naples, with parts of Austria, and the States of the Church—now embraced within that kingdom, were, in 1862, divided into 68 small provinces, named after their respective chief towns; but in the following lists of towns we adhere to the old and well-recognised divisions, as they serve to mark the past condition of the country.

Piedmont, Genoa, and Island of Sardinia.*—Turin 181, Casale 17, Carmagnola 13, Saluzzo 16 (Po), Vigevano 18 (Ticino), Novara 14 (Terdoppio), Voghera 13 (Staffora), Tortona 13 (Scrivio), Alessandria 27, Asti 20 (Tanaro), Fossano 17, Coni 13 (Stura), Mondovi 11 (Pesio), Vercelli 19 (Sesia), Racconigi 11, Savigliano 17 (Maira), Pinerolo 16 (Clusone), San Remo 10, Genoa 128, San Pierre d'Arena 14, Savona 11, Chiavari 10, Spezia 11 (G. of Genoa), Novi 11 (Scrivio), Cagliari 28 (S. Co. I. of Sardinia), Sassari 23 (Turritano).

* In pronouncing Italian proper names, the student will be aided by the following rules :—

a = *a* in English *far*, as in Mortara, Novaro.
e = *a* in *fate*, as in Crema; but when short it is = *e* in *met*, as in Vercelli.
i = *ee* in *meet*, as Messina, Pisa, Arpino (*Mes-see'na, Pee'za, Ar-pee'no*).
o has two sounds as in English—one long, as in Lodi, and the other short, as in Terdoppio.
u = *u* in *full*, as Lucca, Perugia, Pozzuoli (*Look'ka, Pe-roo'ja, Pot-soo-o'le*).
ai = *ai* in *aisle*, as Maira, Cairo (*Mi'ra, Ki'ro*).
au = *ow* in *now*, as in Ausa (*Ow'sa*).
ae makes two syllables, as in Gaeta (*Ga'e-ta*).
ie also makes two syllables, as Pienza, Piemonte, Trieste (*Pi-en'za, Pi-e-mon'te, Tri-est'* or *Tri-es'te*).
c and *cc* before *a*, *o*, *u* = *k*, as Casale, Monaco, Lucca; but before *e*, *i*, *y* = *ch* in *church*, as in Ticino, Piacenza, Lecce (*Ti-chee'no, Pi-a-chen'za, Let'che*).
ch = *ch* in *monarch*, as Secchia, Chiana, Chiente (*Sek'ki-a, Ki-ah'na, Ki-en'te*).
cia, cio, ciu = *cha, cho, chu* in English, as Pescia, Mincio (*Pes'cha, Min'cho*).
g before *a*, *o*, *u* = *g* in *gone*, as Gaeta, Borgo, Gubbio; but before *e*, *i*, *y* = *g* in *gentle*, as Genova, Girgenti (*Je-no'va, Jir-jen'te*).
gg before *e*, *i*, *y* = *dj*, as Reggio, Oleggio, Foggia (*Red'jo, Ol-ed'jo, Fod'ja*).
gh = *gh* in *ghost*, as Alghero, Voghera (*Al-ghe'ro, Vo-ghe'ra*).
gli = *lli* in *million*, as Paglione, Cagliari (*Pal-yo'ne, Cal-yah're*).
gn = *n* in *onion*, or *ñ* Spanish, or *gn* French, as Carmagnola, Bologna (*Car-man-yol'a, Bo-lon'ya*).
j = *y* in *yonder*, as Pistoja, Roja (*Pis-to'ya, Ro'ya*).
sc before *e*, *i* = *sh* in *shall*, as Sciacca, Brescia (*She-ac'oa, Bresh'sha*).
z = English *dz*, and *zz* = *ts*, as Spezia, Nizza (*Sped'zia, Nit'sa*).

Towns bet. 5000 *and* 10,000 *inhabitants.*—Valenza, Trino, Chivasso, Moncaglieri, Carignano, Villafranca, Cavorre, Barge, Trecate, Oleggio, Mortara, *Marengo*, San Salvatore, Alba, Bene, Garessio, Acqui, Castellaza, Nizza-Monferrato, Chiusa, Biella, Caluso, Ivrea, Aosta, Locana, Rivoli, Giaveno, Busca, Sommariva, Lerici, Gavi, Ovada, Quarto, Bosa, Alghero, Ozieri, Tempio, Iglesias, Oristano.

Lombardy.—Milan 196, Busto-Arsizio 10 n. (Olona), Viadana 14, Casal-Maggiore 15, Cremona 31, Codogno 10 n. (Po), Brescia 40 (Mella), Lodi 18, Como 12 (Adda), Bergamo 25 (Brembo), Monza 16 (Lambro), Pavia 29 (Ticino), Voghera 10 (Staffora).

Varese, Revere, Villafranca, Lonato, Salo, Pontevico, Soresina, Chiari, Treviglio, Lecco, Sondrio, Crema, Caravaggio, Borghetta, Binasco, Abbiate-Grasso.

Venetia.—Venice 118, Bassano 12 (Brenta), Adria 13 (Po), Gonzago 16 n. (Secchia), Mantua 30 (Mincio), Cavarzere 12, Legnago 10, Rovigo 36, Verona 59 (Adige), Estó 11 (Agno), Chioggia 27, Padua 54, Vicenza 33 (Bacchiglione), Treviso 22 (Sile), Belluno 14 (Piave), Udine 25 (Roja).

Mestre, Cittadella, Lendinara, Tiene, Schio, Conegliano, Feltre, Serravalla.

Emilia (Parma and Modena).—Parma 47 (Parma), Guastalla 10, Piacenza 39 (Po), Borgo San Donino 10 n. (Taro), Pontremoli 11 (Magra): Modena 32 (Secchia), Finale 12 (Panaro), Reggio 21 (Crostolo), Carrara 18 (Avenza), Massa 15 (Frigido).

Tuscany.—FLORENCE 114, Empoli 16, Pisa 34 (Arno), Volterra 13 (Era), Peschia 12 (Nievoli), Pistoja 22 (Ombrone), Prato 12 (Bisenzio), Arezzo 11, Montepulciano 12 n. (Chiana), Lucca 23 (Serchio), Leghorn 84 (W. coast), Siena 22 (Arbia).

Montevarchi, Poppi, Vinci, Colle, Cortona, Castel-Fiorentino, Porto-Ferrajo, Grosseto.

Romagna, the Marches, and Umbria (formerly belonging to States of the Church).—Ferrara 28 (Po), Bologna 90 (Reno), Imola 11 (Santerno), Faenza 17 (Lamone), Ravenna 19, Forli 18 (Montone), Rimini 17 (Ausa), Pesaro 11 (Foglia), Ancona 32, Sinigaglia 11, Fano 20 (Adriatic), Jesi 19, Fabriano 17 (Esino), Osimo 16 (Musone), Recanati 19, Macerata 10 (Potenza), Tolentino 11, Camerino 12 (Chienti), Fermo 18 (Fermo), Ascoli 11 (Tronto): Perugia 15 (Tiber), Terni 15 (Nera), Rieti 14 (Velino), Spoleto 20 (Marogia).

Urbino, Loreto, Comacchio, Cervia, Orvieto, Gubbio, Foligno, Pontecorvo.

Naples, W. of the Apennines.—Naples 419, Portici 12, Giugliano 11, Afragola 16 n., Pozzuoli 15, Torre del Annunziata 15, Castellamare 15, Resina 12 (Bay of Naples), Gaeta 14 (G. of Gaeta), Teano 12, Arpino 12 n., Sora 12 (Garigliano), Capua 13 (Volturno), Benevento 16, Ariano 13 n. (Calore), Avellino 14 (Sabbato), Caserta 11 n., Maddaloni 18 n., Aversa 16 n., Acerra 12, Nola 12 (Lagni), Sarno 15 n. (Sarno), Salerno 21 (G. of Salerno), Reggio 16 (Str. Messina), Catanzarvo 17, Rossano 14 (E. Co. Calabria), Cosenza 13 (Crati).

Fondi, Ponte Corvo, Sorrento, Isernia, Nocera, Amalfi, Buccino, Sala, Policastro, Paola, Pizzo, Palmi, Scylla, Cotrone, Cassano, Castrovillari.

Naples, E. of the Apennines.—Potenza 15 (Basente), Matera 14, Altamura 17, Gravina 14 (Gravina), Taranto 19 (G. of Taranto), Lecce 18, Francavilla 17 n., Gioja 17 n., Ostuni 16, Mola 12, Bari 33, Bitonto 22, Molfetta 25, Trani 22, Corato 25, Andria 30, Terlizzi 18, Barletta 26 (E. coast), Cerignola 17, Minervino 14 n., Melfi 10 (Ofanto), Foggia 32, Lucera 15 (Salsola), San Severo 17 (Radicosa), Campobasso 14, Vasto 12, Lanciano 18 n., Ortona 13 (Adriatic), Chieti 13, Sulmona 13 n., Aquila 13 n. (Pescara), Teramo 19 (Trontino).

Gallipoli, Nardo, Marsico, Oppido, Brindisi, Manfredonia, Viesti, Bovino, Troja, Atessa, San Angelo.

Island of Sicily.—Palermo 168, Termini 26, Cefalu 11, Mistrella 11, Milazzo 10, Partinico 19, Alcamo 19 n., Monreale 12 n. (N. coast), Trapani 26, Marsala 18, Castelvetrano 15 (W. coast), Sciacca 14, Girgenti 16 n., Alicata 13, Terranova 14, Scicli 10 (S. coast), Nota 13, Syracuse 14, Agosta 14, Catania 65, Acireale 24, Messina 62 (E. coast), Corleone 15 (Belici), Naro 10, Canicatti 20 (Naro), Caltanisetta 20 n., Castrogiovanni 14 (Salso), Mazzarino 11, Piazza 20, Caltagirone 22 n. (Terranova), Vittoria 15, Comiso 16 (Comiso), Ragusa 22 (Ragusa), Modica 27 (Scicli), Paterno 14, Nicosia 14 (Giaretta), Lipari 19 (I. Lipari).

Patti, Calatafimi, Mazzara, Castellamare, Palma, Carini, Salemi, Mussoumeli, Aragona, Pietra-Perzia, Spaccaforna, Lentini, Vizzini, Bronte.

Pontifical States. — ROME 217 (Tiber), Viterbo 14 (Arcone), Civita Vecchia 10 (W. coast), Velletri 13 (Astura), Alatri 11 n. (Cossa).

Frosinone, Tivoli, Corneto, Bolsena, Astura, Albano, Terracina, Anagni, Palestrina.

San Marino.—SAN MARINO 5 (Ausa, above Rimini).

Descriptive Notes.—The kingdom of Italy contains seven towns of above 100,000 inhabitants (Naples, Milan, Turin, Palermo, Genoa, Florence, Venice); six between 100,000 and 50,000 (Bologna, Leghorn, Catania, Messina, Verona, Padua); forty between 50,000 and 20,000 (Parma, Brescia, Placentia, Vicenza, Pisa, Bari, Foggia, Modena, Ancona, Cremona, Andria, Pavia, Cagliari, Mantua, Ferrara, Modica, Alessandria, Chioggia, Barletta, Trapani, Termini, Molfetta, Corato, Bergamo, Acireale, Udine, Sassari, Trani, Treviso, Bitonto, Caltagirone, Lucca, Siena, Ragusa, Reggio, Salerno, Caltanisetta, Piazza, Asti, Canicatti); and a hundred and forty between 20,000 and 10,000.

Turin (*anc.* Augusta Taurinorum, *Ital.* Torino), capital of Piedmont, ranks as the first city in Italy for the number and importance of its literary institutions, amongst which the university occupies the first place. It was an important place even in the time of Hannibal, who destroyed it; but Augustus made it a Roman colony. Near Turin, on the S.W., are the three valleys which in the middle ages formed the home of the Waldenses, the early pioneers of the reformed religion. **Casale**, once the capital of the celebrated Marquises of Montferrat, has an important manufactory of silk twist. **Vigevano**, occupied with the manufacture of silk stuffs, hats, soap, and macaroni. **Alessandria**, a large fortified town on the Tanaro, with extensive trade and two annual fairs. **Asti**, celebrated in the middle ages for its industry and commerce; the birthplace of Alfieri, the dramatist, in 1749. The country around abounds in mineral springs, and produces the best wines in Piedmont. **Vercelli** contains a valuable library of old MSS., including a copy of the laws of the Lombards, and a MS. of the Gospels, written by Eusebius in the fourth century: it carries on a large trade in rice, which is raised in the vicinity. **Racconigi** and **Savigliano**, with important manufactures of silk, linen, and woollen fabrics. **Pinerolo**, a trading and manufacturing town at the foot of the Alps. **Marengo**, memorable for the decisive victory of the French over the Austrians, 14th June 1800. **Genoa** (*Ital.* Genova, *anc.* Genua), a celebrated and ancient city, originally the chief town of the Ligurians, did not rise to any historical importance until the period of the middle ages. From the 11th to the 18th century it was the capital of a commercial republic, which planted numerous colonies in the Levant and on the shores of the Black Sea. It was taken by the French in 1797, and ceded to Sardinia in 1815. It is a flourishing seaport, the

seat of a university, and of extensive trade: was the birthplace of Columbus, in 1435. **Novi**: here the French were defeated by the Austro-Russian army in 1799. **Cagliari** (*anc.* Caralis), originally a Carthaginian colony, and the capital of the island Sardinia under the Romans, is a fortified maritime city, the residence of a viceroy, and the seat of a university. **Sassari**, the most important place in the island except Cagliari, has a university, museum, and public library, and a trade in tobacco and fruits. **Milan** (*Ital.* Milano, *anc.* Mediolanum), formerly capital of the Lombardo-Venetian kingdom, an ancient, populous, and magnificent city on the left bank of the Olona; adorned by numerous elegant public buildings, is of a circular shape, enclosed on three sides by a wall surrounded by broad ramparts nearly eight miles in circumference. From its position on the great line of railway leading from Venice to Turin, and on the principal route across the Alps, it is favourably situated for trade. Milan was the ancient capital of the Insubres, who founded it, B.C. 400; was taken by the Romans, B.C. 222; was inhabited and embellished by many of the Roman emperors. On the division of the empire under Diocletian it became one of the capitals, and continued to be the residence of the Emperors of the West till the invasion of the Huns, who took and plundered it. The poet Virgil studied at Milan; it was the see of St Ambrose, and the birthplace of many popes and eminent men; was capital of a republic in 1056; in the end of the 14th century was made the capital of the Duchy of Milan; passed successively under the dominion of Spain, Austria, and France; in 1805 became capital of the Kingdom of Italy; was restored to Austria in 1815; was taken by the French and Sardinian army in 1859, and ceded to Sardinia by the treaty of Villafranca in the same year. **Cremona**, a fortified city on the Po, long famous for its violins. **Brescia**, an important commercial and manufacturing city, noted for its fine wines, cutlery, and firearms. **Lodi**, celebrated for the decisive victory obtained by Napoleon I. over the Austrians in 1796. **Como**, at the S.W. extremity of the beautiful lake of same name, has extensive manufactures of cloth and silk, and is the birthplace of the Younger Pliny. **Bergamo**, a fortified city, with numerous manufactures, and a great annual fair, at which the sales sometimes amount to £1,200,000. **Monza**: here are kept the regalia and iron crown of Lombardy. **Pavia** (Ticinum, and afterwards Papia) is a place of historical interest; has a university, founded by Charlemagne, in which Spallanzani and Volta were professors. **Venice** (*Ital.* Venezia, *anc.* Venetia), a famous city of Italy, built on piles in the centre of a large lagoon, was for many centuries the capital of a celebrated republic, which dates its origin from the invasion of Attila in 452, and which attained its acme of prosperity in the 15th century, when it was reckoned the first maritime and commercial power in the world. It began to decline in the 16th century, and its overthrow was completed by Napoleon in 1797; it was made over to Austria in 1814, and now forms the capital of the province Venetia. It is the birthplace of Canova, one of the greatest of modern sculptors; and Titian, the prince of portrait-painters, was born in its vicinity. **Bassano**: here the French defeated the Austrians in 1796. **Adria**, an ancient seaport town, which gave its name to the Adriatic, is now fourteen miles inland, and in the centre of the delta of the Po: contains many remains of splendid edifices. **Mantua**, a strong fortress on the Mincio; the poet Virgil was born in its vicinity. **Verona**, a large, strongly-fortified city on the Adige, of great historical interest, and containing numerous Roman remains, especially an amphitheatre, the most perfect of its kind now existing; renowned for its dye-

works and silk-mills; and the birthplace of Cornelius Nepos, Catullus, the elder Pliny, Paul Veronese, and several other eminent men. **Chioggia,** on an island in the Venetian lagoon, is a fortified seaport town of considerable commercial importance. **Padua,** a celebrated and strongly fortified city on the Bacchiglione, with a university once very famous and attended by 1800 students, among whom were Tasso and Columbus. It is the birthplace of Livy the historian, and Belzoni the traveller. **Vicenza,** an important manufacturing city, extensively engaged in the silk trade; birthplace of Palladio. **Treviso** and **Udine** have numerous manufactures of silk, cotton, linen, and paper. **Parma,** formerly cap. of duchy of same name, has some silk manufactures and a fine picture-gallery. **Piacenza** (*anc.* Placentia) was founded by the Romans, B.C. 219, as a protection against the recently-subdued Gauls. It is a well-built and handsome city, adorned with many fine works of art. Here Hannibal defeated the Romans, B.C. 219; it is the birthplace of Pope Gregory X., Cardinal Alberone, Pallavicini, and Laurentius Valla. **Modena** (*anc.* Mutina), of Celtic origin, and the first place which the Romans took from the Boii, was formerly cap. of duchy of same name; contains a university, botanic garden, and rich cabinets of natural history. **Reggio,** a fortified city on the Crostolo, the birthplace of Ariosto in 1474, and of Correggio, the painter, in 1494. **Carrara** and **Massa** have famous quarries of statuary marble. **Florence** (*anc.* Florentia, *Ital.* Firinze), formerly cap. of the Grand Duchy of Tuscany, and now of the Kingdom of Italy, is a walled city on the Arno, surrounded by most delightful scenery, and adorned by many magnificent works of art. The Florentine Gallery contains the richest collections of paintings, sculpture, and antiquities in the world; also a university, and numerous scientific and educational establishments; various manufactures of silk, carpets, straw-hats, mosaic work, porcelain, and jewellery; birthplace of Dante, Leonardo da Vinci, Boccaccio, Machiavelli, Amerigo Vespucci, Vannuchi, Cellini, and Pope Leo. X. **Pisa,** an ancient decayed city on the Arno, containing many noble edifices built of marble—a fine cathedral—a famous leaning tower, 178 feet in height, the topmost story of which overhangs the base about 13 feet—an ancient university, which is still the great centre of education in Tuscany. Pisa was one of the twelve cities of ancient Etruria: from the 10th to the 14th century it was the capital of an enterprising republic; and here Galileo was born in 1564. **Volterra,** with numerous Etruscan antiquities: in the vicinity are singular borax lagoons, rich copper-mines, brine-springs, salt-works, and quarries of alabaster, from which beautiful vases are largely exported. **Pistoja** claims the invention and first manufacture of pistols; and continues to construct firearms, cutlery, and surgical instruments. **Prato**: numerous manufactures and copper-works for smelting the copper found in its vicinity. **Arezzo** (*anc.* Arretium), one of the twelve Etruscan cities; birthplace of Mecænas, Petrarch, Michael Angelo, Vasari, Guido, and Redi. **Lucca,** originally a Ligurian town, has an ancient amphitheatre in a tolerable state of preservation, and of great size; a cathedral containing many valuable paintings; manufactures of silk, woollen stuffs, and paper, and famed for its mineral baths. **Leghorn** (*Ital.* Livorno), originally one of the twelve independent Etruscan towns, remained a place of importance till the fall of the Western Empire, and still contains many interesting remains of antiquity: it is the principal seaport of Tuscany; is noted for the manufacture of Tuscan straw-plait, woollen caps, glass, and paper; it ranks as the greatest commercial emporium in Italy, and embraces all the foreign trade of Tuscany; contains

the remains of Smollett the novelist. **Siena** was the capital of a powerful republic in the middle ages, when it contained 100,000 inhabitants; several magnificent public edifices adorned with paintings of the Siennese school, and contains a university. The mountains in the vicinity contain rich marble quarries. **Ferrara** (Forum Allieni), capital of a delegation, and the most northern city of the Papal States, on an arm of the Po; is fortified and garrisoned by Austrian troops. It is the seat of a famous university, at which Ariosto was educated; contains a public library of 80,000 volumes, besides numerous MSS., including some of Ariosto and Tasso; and was for a time the asylum of Calvin, Marot, and other reformers. **Bologna** (Bononia), once the capital of the Etruscans, and now of a legation. In regard to population, it is the second city of the Papal States; is the seat of a famous university, which, in 1841, had 560 students; the birthplace of Galvani, Aldrovandi, Malpighi, the painters Guido, Albano, Domenichino, and the three Caracci. **Faenza** (Faventia), long celebrated for its earthenware, and supposed to have been the first Italian city where the manufacture of that article was introduced. It was the birthplace of Torricelli, the inventor of the barometer. **Ravenna**, a very ancient town, founded by the Pelasgi; the residence of the emperors when Italy was threatened by the barbarians, and one of the principal stations of the fleet. It is rich in antiquities of the early middle ages. **Forli** (Forum Livii), the seat of a university, and of a cardinal legate; possesses considerable trade and manufactures. **Rimini** (Ariminum), originally an Umbrian town, was colonised by the Romans, B.C. 268; became the seat of a great ecclesiastical council, A.D. 359; and has important sulphur-mines in the vicinity. **Ancona**, capital of a delegation, and a fortified seaport, which is one of the best frequented in Italy. **Loreto** owes its origin to a famous chapel of the Virgin, over which a magnificent church has been built. **Urbino** (Urbinum Hortense), capital of delegation Urbino e Pesaro; contains a ducal palace, a cathedral, a college, and a manufactory of pins, and was the birthplace of Raphael in 1483. **Perugia** (*anc.* Perusia) was one of the twelve Etruscan cities: under the empire it was the most important city of Etruria, and long defied the power of the Goths. Some of the most interesting Etruscan antiquities have been found here. It is now the capital of a delegation, and only noted for its two great annual fairs. **Terni**, noted for the magnificent waterfalls in the vicinity, unrivalled in Europe, though of artificial origin. **Rieti** (*anc.* Reate), situated in a lovely valley, which is said to rival in beauty the Thessalian Tempe. **Gubbio** (*anc.* Iguvium): here were discovered, in 1444, in the ruins of the temple of Jupiter, seven bronze tables with Umbrian inscriptions, forming most interesting remains of that language; they are known as the Eugubian Tables, and are still preserved at Gubbio. **Naples**, formerly capital of the kingdom of the Two Sicilies, beautifully situated on the bay of same name, is by far the most populous city in Italy. It is very ancient, having been founded about four centuries before the Christian era. It is the principal seaport of southern Italy, and the centre of its learned institutions. In its vicinity are the celebrated ruins of Pompeii and Herculaneum, which were buried during an eruption of Mount Vesuvius (A.D. 79), and accidentally discovered in 1720, since which time the excavations have brought to light many of the most valuable relics of antiquity. **Castellamare**: here the elder Pliny perished in the catastrophe which buried Pompeii, A.D. 79. **Gaeta**, a fortified seaport town, which formed the asylum of Pius IX., when, in 1849, he fled from Rome, to join the fugitive King of Naples. **Capua** is strongly fortified, and is the only fortress that covers the approach to

Naples. **Benevento** was the seat of several councils in the eleventh and twelfth centuries. **Avellino**: near it the Val di Gargano, famous for the victory of the Samnites over the Romans, in the year of Rome 433. **Salerno**, noted for its ancient school of medicine, contains a university. **Reggio**, opposite Messina, is the most southern city and seaport of continental Italy, and very ancient. It was touched at by St Paul on his voyage to Rome. **Taranto**, an ancient city of great historic celebrity, but now a place of little importance. **Barletta**, a fortified seaport town, carrying on a brisk coasting trade. **Foggia** is considered the second city in Naples for wealth and importance. **Aquila**, birthplace of Sallust, is one of the most commercial cities in the kingdom of Naples. **Palermo**, capital of Sicily, and the fourth city in Italy as regards population, is of very ancient origin, having been founded by the Phœnicians. It is a spacious and well-built city, with extensive commerce. It was the scene of the massacre called the "Sicilian Vespers" (in 1282), which, commencing in the freak of a Frenchman who had insulted a Sicilian lady going to church, ended in the extermination of every Frenchman in the island. **Trapani**, a busy commercial town engaged in the coral fishery. **Marsala**, noted for its wines, which it largely exports to England. **Girgenti**, a very ancient and celebrated city, is the chief port in Sicily for the exportation of sulphur. **Syracuse**, founded by Corinthian colonists, B.C. 734, was for ages a place of great historic importance: it was the birthplace of Archimedes, and the residence of Plato and Cicero, but has now dwindled into insignificence. **Catania**, at the foot of Mount Etna, and the third most important city in Sicily, has been repeatedly ruined by earthquakes: the houses are built and the streets paved with lava: it has manufactures of silk, and wares made of lava and amber, and exports corn, macaroni, olives, figs, raw silk, wine, and snow from Mount Etna. **Messina**, the most populous city in Sicily, except the capital, which it equals in commercial importance. The harbour is regarded as one of the finest in Europe, and is well fortified. The Strait of Messina, with a rock named Scylla on the one side, and an eddy called Charybdis on the other, was much dreaded by ancient mariners. **Lipari**, in an island of same name, exports pumice-stone to all parts of the world, as also sulphur, nitre, and soda. **Rome**, on the left bank of the Tiber, 16 miles from its mouth, is, next to Jerusalem, the most celebrated city in the world. It was founded B.C. 753; at the beginning of our era it had upwards of 1,000,000 inhabitants, and was the mistress of the then known world; in A.D. 410 it was conquered by the Goths under Alaric; it was given to the popes by Pepin and Charlemagne in the eighth century, since which time it has been the capital of the Pontifical States. Rome is unrivalled for its artistic and architectural riches, but has a sad and desolate appearance. The streets are narrow, dirty, and unpaved, the finest palaces and the most wretched hovels being in closest juxtaposition. The Cathedral of St Peter's is the largest and most sumptuous structure of the kind in the world, and the Vatican Palace adjoining is the permanent residence of the popes. The university, which dates from 1244, is well attended, but is less celebrated than the college of the Propaganda, in which natives of all parts of Europe are trained as missionaries for propagating the "Catholic" faith throughout the world. **Civita Vecchia**, the principal seaport of the Pontifical States. **Velletri**, the birthplace of the Emperor Augustus, B.C. 63. **San Marino**, the capital of one of the smallest and most ancient states in Europe, which has an area of only 24 square miles, and a population of 7303 inhabitants, who are chiefly occupied in rural industry and silk-manufactures.

Capes and Islands.—Piombino and Argentaro, in Tuscany; Circello, W. of the Pontifical States; Palinuro and Vaticano, W. of Naples; Spartivento, Nau or Colonna, and Leuca, S. of Naples; Otranto and Gargano, in the Adriatic; Passaro, San Vito, and Ras Culmo, in Sicily; Teulada and Carbonara, S. of island of Sardinia. The Italian islands are arranged into four groups or clusters—viz., the Sardo-Corsican, Sicilian, Maltese, and Ponza groups.

The Sardo-Corsican Islands, separated from the mainland by the Tyrrhenian Sea, are chiefly Sardinia (the second largest island in the Mediterranean; area, 9167 sq. m.; pop. 588,064); Corsica, which belongs to France; and Elba. *The Sicilian Group*, which nearly connects the Italian peninsula with the African coast, consisting principally of Sicily (the largest island in the Mediterranean; area, 11,290 sq. m.; population, 2,392,414); the Lipari Islands (Stromboli, Lipari, Vulcano, &c.), Ustica, Favignana, and Pantellaria. *The Maltese Group*, belonging to Great Britain, and consisting of Malta (area, 98 sq. m.; pop. 134,055); Gozo, and Comino. *The Ponza Group*, W. of Naples, chiefly Ponza, Ischia, and Capri.

Seas, Gulfs, and Straits (all forming parts of the Mediterranean): the Tyrrhenian Sea, between Italy and the Sardo-Corsican Islands; Ionian Sea, between Italy and Greece; Adriatic, between the Italian and Hellenic peninsulas. Gulfs of Genoa, Gaeta, Naples, Salerno, Policastro, and St Eufemia, on the W. side; of Squillace and Taranto on the S.; and of Manfredonia and Venice in the Adriatic. Strait of Messina, between Naples and Sicily; Bonifacio, between the islands Corsica and Sardinia; Otranto, between Naples and Turkey.

Surface and Mountains.—Italy embraces three great natural divisions—viz., *first*, the great plain of Lombardy in the north, between the Alps and the Apennines, sloping towards the Adriatic, watered by the Po, Adige, and other streams, and extremely fertile; *second*, the long, narrow peninsular portion, projecting into the Mediterranean in a south-easterly direction, and having the long mountain-chain of the Apennines as its back-bone; and, *third*, Sicily, Corsica, and Sardinia, or the insular portion. Corresponding to these, there are, in like manner, three great mountain-ranges; the first of which (the Alps) separates Italy from the rest of the continent; the second (the Apennines) traverses the mainland in the direction of its greatest length, and extends to the farthest extremity of Sicily; while the third stretches from N. to S. through the Sardo-Corsican islands. The Alps have been already described under "Europe," as also under France, Switzerland, and Austria.

The *Apennines* branch off from the Maritime Alps near Genoa, extend in a S.E. direction through the entire length of the peninsula, and form the water-parting between the Tyrrhenian Sea and the Adriatic. They are of greatly less elevation than the Alps, and nowhere attain the height of the snow-line, except in Sicily, though some of the continental summits are covered with snow for nine months in the year. *Monte Corno*, in the N. of Naples, the highest summit of the continental Apennines, 9521 feet; *Monte Velino*, in N.W. of Naples, 8180 feet; *M. Vesuvius*,

near Naples, 3948 feet; *M. Etna* in Sicily, the highest summit of the entire range, 10,874 feet: line of perennial snow, in Sicily, 9500 feet.

The *Sardo-Corsican* range extends from Cape Corso, in the N. of Corsica, to Cape Spartivento in the S. of Sardinia, and forms the water-parting between the Tyrrhenian Sea and the Mediterranean proper: highest summits, *Monte Rotondo*, in Corsica, 9068 feet, and *Monte Genargentu*, in Sardinia, 7000 feet.

Mountain-Passes.—The most frequented of these are the following:—*Col di Tende*, in the Maritime Alps, 5890 feet above the level of the sea, and leading from Coni to Nice. *Pass of Mont Genèvre*, in the Cottian Alps, 6560 feet, from Susa to Briançon. *Pass of Mont Cenis*, from Susa to S. Jean de Maurienne, in Savoy, 6775 feet. *Pass of Great St Bernard*, 8150 feet, between Piedmont and the Valais. *Simplon Pass*, 6592 feet, from Milan and Domodossola to Canton Valais. For the remaining passes across the Alps, see under "Switzerland" and "Austria."

River-Basins.—Owing to the peninsular character of the country and the position of the mountain-chains, there is only one extensive river-basin in all Italy—viz., that of the Po, which is limited by the Alps on the one side and the Northern Apennines on the other, and embraces (if we include the rivers which flow into its delta) an area of 34,600 sq. m.

Table of Rivers and Towns.—In the following table will be found all the principal rivers and affluents of rivers of the Italian peninsula, beginning at the G. of Genoa and ending at the G. of Trieste, together with all the towns containing 5000 inhabitants and upwards situated on their banks:—

Basins inclined to the Tyrrhenian Sea.

Rivers.	*Towns.*
G. of Genoa,	San Remo, *Porto Maurizio*, *Oneglia*, Savona, Genoa, Chiavari, Spezzia, *Lerici*.
Magra,	Pontremoli.
Avenza,	Carrara.
Frigido,	Massa-di-Carrara.
Serchio,	Lucca.
Arno,	Pisa, Empoli, FLORENCE, *Signa*, *Montevarchi*, *Poppi*, *Vinci*.
Era, *l*	Volterra.
Nievoli,	Peschia.
Elsa, *l*	*Colle*.
Ombrone,	Pistoja.
Bisenzio,	Prato.
Chiana, *l*	Arezzo, Montepulciano, n.
Co. of Tuscany,	Leghorn.
Ombrone Senese,	*Grosseto*.
Arbia,	Siena.
Marta,	*Corneto*, *Bolsena*.
Arcone, *l*	Viterbo.
Co. Pontifical States,	Civita Vecchia.
Tiber,	ROME, Perugia.
Teverone, *l*	*Tivoli*.
Nera, *l*	Terni,
Velino, *l*	Rieti.
Paglia,	*Orvieto*.
Topia, *l*	*Foligno*.
Chiasco,	*Gubbio*, n.
Marogia, *l*	Spoleto.
Astura,	Velletri, *Albano*, n.
Amasena,	*Terracina*.
G. of Gaeta,	*Fondi*, n., Gaeta.
Garigliano,	*Ponte Corvo*, Arpino, n., Sora.
Sacco,	*Anagni*, n., *Palestrina*.
Cossa, *l*	*Frosinone*, Alatri, n.
Savone,	Teano.
Volturno,	Capua, *Isernia*, n.
Calore, *l*	Benevento, Ariano, n.
Sabbato, *l*	Avellino.
Lagni,	Caserta, n., Maddaloni, n., Aversa, n., Acerra, Nola.
G. of Naples,	Pozzuoli, Afragola, n., Fratta Maggiore, Giugliano, NAPLES, Portici, Torre del Annunziata, Castellamare, *Sorrento; Ruins of Herculaneum and Pompeii*, Resina.

Basins inclined to the Tyrrhenian Sea (continued).

Rivers.	*Towns.*
Sarno,	*Nocera*, Sarno, n.
G. of Salerno,	*Amalfi, Salerno; Ruins of Pæstum.*
Sele,	*Buccino, Sala.*
G. of Policastro,	*Policastro.*
West Co. Calabria,	Nicastro, n., *Pizzo, Paola, Palmi.*
St. of Messina,	*Scylla*, Reggio.

Basins inclined to the Ionian Sea.

East Co. Calabria,	Catanzaro, *Cotrone*, Rossano.
Crati,	Cosenza.
Sibari, *l.*	*Cassano, Castro-Villari.*
G. of Taranto,	Taranto, *Nardo, Gallipoli.*
Agri,	*Marsico.*
Basente,	*Potenza.*
Bradano,	Matera, n., *Oppido.*
Gravina,	Altamura, n., Gravina.

Basins inclined to the Adriatic.

East Co. Otranto,	Lecce, n., *Brindisi*, Francavilla, Ostuni.
Co. of Bari,	Mola, Gioja, n., Bari, Bitonto, Molfetta, Trani, Corato, n., Andria, n., Terlizzi, Barletta.
G. of Manfredonia,	*Manfredonia, Viesti.*
Ofanto,	Cerignola, n., Minervino, n., Melfi.
Cervaro,	*Bovino, Troja*, n.
Cesone,	Foggia.
Salsola, *l.*	Lucera.
Radicosa,	San Severo.
Biferno,	Campo-Basso.
Sangro,	*Atessa.*
Co. Abruzzo,	Vasto, Lanciano, n., Ortona.
Pescara,	Chieti, Sulmona, Aquila.
Piomba,	*S. Angelo.*
Trontino,	Teramo.
Tronto,	Ascoli.
Fermo,	Fermo.
Chienti,	Tolentino, Camerino.
Potenza,	Recanati, Macerata.
Musone,	*Loreto*, Osimo.
E. Co. Marches,	Ancona.
Esino,	Jesi, Fabriano.
Misa,	Sinigaglia.
Metauro,	Fano, *Urbino*, n.
Foglia,	Pesaro.
Ausa,	Rimini, San Marino.
Savio,	*Cervia*, n.
Montone,	Ravenna, Forli.
Lamone,	Faenza.
Santerno,	*Comacchio*, Imola.
Reno,	Bologna.
Po,	Adria, Ferrara, *Revere*, Guastalla, Viadana, *Sabionetta*, n., Casal-Maggiore, Cremona, Codogno, Piacenza, Pavia, *Valenza*, Casale, *Trino, Crescentino, Chivasso*, Turin, *Moncaglieri, Carignano*, Carmagnola, *Villafranca, Cavorre*, n., Saluzzo, n., *Barge.*
Panaro,	Finale.
Secchia,	Gonzago, Modena.
Mincio, *l.*	Mantua, *Villafranca*, Lo (L. Garda), *nato, Salo.*
Oglio, *l.*	(L. *Pontevico, Soresina*, Chiseo), *ari.*
Mella, *l.*	Brescia.
Crostolo,	*Guastalla*, Reggio.
Parma,	Parma.
Taro,	Borgo-San-Donino, n.
Adda, *l.*	(L. Lodi, *Treviglio*, n., *Lecco*, Como), Como, *Sondrio.*
Serio, *l.*	*Crema, Caravaggio.*
Brembo, *l.*	Bergamo, n.
Lambro, *l.*	*Bhorgetta*, Monza.
Olona, *l.*	Milan, Busto-Arsizio, n., *Varese.*
Ticino, *l.*	(L. Pavia, *Binasco*, n., Vigevano, *Abbiate-Grasso*, n., *Trecate, Intra, Locarno*, Bellinzona.
Toccia,	*Domodossola.*
Tresa, *l.*	(L. *Lugano.* Lugano),
Terdoppio, *l.*	Novara, *Oleggio.*
Staffora,	Voghera.
Gogna, *l.*	*Mortara*, n., *Borgo-Manero.*
Scrivio,	Tortona, Novi.
Tanaro,	*Marengo*, Alessandria, *San-Salvatore*, Asti, *Alba*, Bra, Cherasco, *Bene*, n., *Garessio.*
Bormida,	*Acqui.*
Orbe,	*Castellazzo, Gavi, Ovada.*
Belbo,	*Nizza-Monferrato.*
Stura, *l.*	Fossano, Coni.
Pesio, *l.*	Mondovi, n., *Chiusa.*
Sesia, *l.*	Vercelli.
Cervo,	*Biella.*
Dora-Baltea, *l.*	*Caluso, Ivrea, Aosta.*
Orca, *l.*	*Chivasso, Locana.*

Basins inclined to the Adriatic—(continued).

Rivers.	*Towns.*
Dora-Ripa-ria, *l*	TURIN, *Rivoli.*
Sangone, *l* ..	*Giaveno.*
Maira, ...	*Sommariva*, Raconigi, Savigliano, *Busca.*
Clusone, *l* ..	Pinerolo.
Adige, ...	Cavarzere, Rovigo, *Lendinara*, Legnago, Verona, *Roveredo*, Trient or Trent, *Meran*, *Glurns.*
Agno, *l*	Este.
Eisach, ...	Botzen, *Brixen.*
Bacchiglione,	Chioggia, Padua, Vicenza, *Tiene*, *Schio.*
Brenta, ...	VENICE, n., *Mestre*, *Cittadella*, n., Bassano.
Sile, ...	Treviso.
Piave, ...	*Conegliano*, n., *Feltre*, Belluno.
Meschio, *l* ..	*Serravalla.*
Tagliamento,	*Latisana*, *Tolmezzo.*
Isonzo, ...	*Aquileja*, n., *Gradisca*, Görz.
Roja, ...	Udine.
Idria, *l*	*Idria.*

Lakes.—Italy is studded with many beautiful lakes, especially the basin of the Po, near the foot of the Alps, where lakes Garda, Como, Maggiore, &c., are unrivalled for their enchanting scenery.* They are numerous also in Central Italy, between the branches of the Apennines, where they sometimes occupy the craters of extinct volcanoes, and have no visible outlet. The following are the principal lakes in the order of the river-basins in which they occur:—

Basin of the Po—*Garda* (560 sq. m.; elevation, 227 feet above the sea), drained by the Mincio; *Iseo*, by the Oglio; *Como*, by the Adda; *Maggiore*, by the Ticino; *Lugano*, by the Tresa. Ombrone—*Castiglione* and *Orbitella*, in the Maremma of Tuscany. Arone—*Bracciano*, in Pontifical States. Marta—*Bolsena*, in Pontifical States. Tiber—*Perugia*, with no visible discharge. Garigliano—*Celano* or *Fucino*, in N. of Naples, drained by an artificial channel; *Averno*, 10 miles W. of Naples, occupies the crater of a volcano.

Climate.—From its position, form, and configuration, Italy enjoys an extremely delightful climate, which permits the productions of the temperate, and some of the torrid zone, to mingle on its almost uniformly fertile surface. In the northern parts the cold is sometimes severe; but it is little felt in the centre and south, where the plains enjoy an almost perpetual spring. The valley of the Po considerably resembles in temperature the central parts of France: the lakes freeze in winter, and the orange and lemon will not ripen in the open air. At Rome frost seldom lasts over the night, and snow falls, on an average, on only two days in the year, as also at Florence, Naples, and Palermo. At Venice snow falls on five days annually, at Milan on ten, while in Malta snow-flakes are never seen. In the north the rainfall is great, being at Tolmezzo, near Udine, 100 inches; at Rome, 35 inches; while at Palermo, in Sicily, it is only 22 inches, The average for the entire peninsula is about 45 inches. The mean annual temperature of Rome is 59°.5; mean winter, 45°.2; and mean summer, 74°.2. The mean annual temperature of Milan is 55°; Naples, 61°; Palermo, 64°, and Malta 67°.

The higher Alps are covered with perennial snow, to the level of 9500

* The lakes of N. Italy are deep reservoirs in the bosom of the mountains. Garda is the largest, and is celebrated for the deep-blue hue of its waters, while Maggiore is reckoned the most beautiful, and Como the most sublime.

feet. Nearly one-half of Mont Blanc is always protected by a snowy envelope, which thickens every winter by fresh accumulations, and contracts again in summer and autumn by the action of the sun's rays, and by the constant discharge, from its lower margin, of those famous glaciers which are the admiration of all travellers.—(See under "Switzerland.") The climate is, generally speaking, highly salubrious, save in the pestilential marshes of Tuscany, called the *Maremma*, and the *Campagna di Roma*, in the Pontifical States, the malaria from which is extremely injurious to human life. The prevailing winds are W. and S.W., and during their continuance the air is pure and healthy; but the southern portion of the country is frequently visited by the pestilential winds of Africa, during which vegetation is arrested, and the human frame becomes languid and feeble.

Geology and Minerals.—Tertiary and post-tertiary strata cover greatly more than a half of Italy, especially the extensive basin of the Po; the northern portion of the peninsula from Genoa to Civita Vecchia, on the W. side; and the entire belt lying between the Apennines and the Adriatic, on the E.; together with a large part of Sicily and Malta. Secondary strata occupy considerable areas in central and southern Italy, especially from the Tiber to the G. of St Eufemia; a large tract in the centre of Sicily; and the southern slope of the Rhætian and Carnic Alps. The central and higher ridges of the Alps consist of gneiss and other primary rocks, flanked by limestone, sandstone, and slate; and primary strata prevail on both sides of the Strait of Messina, and in the east side of Corsica and Sardinia. Granite rarely occurs except in the islands just named, where it covers large areas. Trap-rocks are found in numerous small patches around the G. of Genoa and N. of the Po; and volcanic formations are extensive, especially around Rome, Naples, Malfi, the E. side of Sicily, and the N.W. corner of the island Sardinia, more particularly in the neighbourhood of Syracuse and Mount Etna, as also in the Lipari Isles, where Stromboli, Vulcano, and Vulcanello are still active volcanoes.

Minerals.—The mineral products of Italy, though numerous, are not turned to much account, mining being everywhere neglected. There are few metals, except iron and lead, the first of which is very abundant in Elba, while copper, manganese, cobalt, and quicksilver are found in the Apennines: coal is plentiful in Venetia, Sardinia, and Tuscany; salt, alum, and borax in many localities; alabaster in Tuscany; and beautiful statuary marble at Carrara and other places. But the volcanic products of Italy, especially sulphur, nitre, and lava, are of greater value than all its other minerals, nearly all the sulphur required in Europe being obtained from Sicily. The principal minerals of the Alps are iron, copper, lead; but quicksilver, rock-salt, and some gold and silver, are met with.

Botany and Agriculture.—The indigenous vegetation of Italy, including the Alpine region in the N., is mainly embraced within Schouw's *first* and *third* phyto-geographic regions. The first, or *Arctic-Alpine Region*, comprehends the summits of the lofty mountain-ranges, while the low grounds belong to the third or Mediterranean Region. Italy, as a whole, presents an admirable epitome of the characteristic floras of all the countries of Europe, Western Asia,

and Northern Africa. According to Cesati, the number of flowering-plants in Lombardy alone amounts to 2568 species, of which 514 are monocotyledons, and 2054 dicotyledons.

In Sicily, Naples, and Malta, in addition to the plants common to all the peninsula, not a few tropical species appear, such as the cotton-plant, sugar-cane, papyrus, pistachio, and date-palm. The Indian fig also, a species of cactus, grows wild in Sicily. All these ripen at an elevation of about 600 feet; evergreens flourish at 2000 feet; the oak and chestnut grow on the mountain-sides as high as 4000 feet; wheat thrives at 4500 feet; and the beech at 6000 feet. In Central Italy we find the flanks of the Apennines covered with a rich and varied vegetation up to 3200 feet; the lower zone is occupied by the orange, citron, olive, and palm; forests are rare; and the mountains, above the level indicated, present bare rocks devoid of vegetation. The Alps afford excellent pasture, and the forests contain a great variety of timber. The vertical limits of vegetation along their sides are as follows:—The dwarf-palm and orange arrive at maturity at the foot of the Maritime Alps; wheat is cultivated at the height of 3600 feet; oats, 4300 feet; barley, 5100 feet; the chestnut grows in the valleys at 3600; oak, 4500; pine and larch, 6500 feet. Human inhabitants are found as high as 6300 feet, where potatoes and turnips are the only esculents. The zone lying between the upper limit of trees and the lower limit of perennial snow, is the province of the *Alpine flora* above alluded to, characterised by the juniper, alder, rhododendron, willow, cranberry, saxifrages, mosses, and lichens, extending to 9500 feet.

Agriculture.—Were the Italians as active, industrious, and skilful as their soil is good and their climate propitious, few countries in the world could rival Italy in agricultural wealth and prosperity. So far, however, is this from being the case, that there is scarcely a country on the continent which does not leave it behind in all matters connected with successful husbandry. In Lombardy, Venetia, and Piedmont, however, agriculture is better understood; the soil, which is a rich alluvium, is cultivated with great care, and artificial irrigation is extensively practised. Here the principal crops are rice, maize, wheat, rye, oats, barley, vines, olives, figs, oranges, citrons, hemp, flax, and the mulberry plant. About two-fifths of the peninsula are under cultivation, the remainder being either bare rocks, devoid of vegetation, or available only for summer pasturage. Vegetation is never interrupted on the lower grounds, especially in the southern half of the peninsula. The vine flourishes universally, but the wines of Italy cannot compete with those of France and Spain. Little wine is exported, except from Tuscany and Sicily. The Tuscan wines are of inferior quality, but the Marsala wines of Sicily are extensively consumed in England and America, owing to their cheapness. The Neapolitan wine is the best in Italy; the celebrated *Lachryma Christi*, a red wine of great excellence, is grown in vineyards on the flanks of Vesuvius. Olive oil is the principal article of export from the Neapolitan portion of the kingdom, but some good oil is also produced in Tuscany. In many districts, however, the mulberry plant is now supplanting the olive. In Southern Italy, where the soil is volcanic, well watered, and highly fertile, the chief crops are wheat, maize, rice, cotton, indigo, sugar, olive oil, tobacco, dates, melons, and other fruits.

Zoology.—There seem to be few, if any, wild animals peculiar to the Italian peninsula, unless the crested hedgehog, found in the south of Naples, be an exception. On the other hand, however,

few species are wanting here of those found in the other parts of Southern Europe.

The Mammalia comprise 68 species, including 42 carnivora, 16 rodents, 9 ruminants, and 1 pachyderm—viz., the wild boar of Calabria. The carnivora embrace the bear, badger, marten, dog, wolf, fox, civet, wild-cat, shrew, desman, and numerous bats; the ruminants, the buffalo, deer, goat, and sheep; and the rodents, the hare, squirrel, dormouse, and arvicola. Of the 294 species of Birds there are numerous species unknown in the British Isles. Reptiles of every order are very numerous, embracing no fewer than 47 species. Of the 444 Fishes found in the Mediterranean, the great majority frequent the coasts of this peninsula; and some of the fisheries there established, especially those of the tunny, anchovy, pilchard, and mackerel, are of great value. The Articulated animals are also very numerous, including the bee and silkworm (both of which are of great economic importance); the tarantula, scorpion, and white ant, all highly noxious; the locust, which not unfrequently makes its appearance in devastating swarms; and the butterflies, remarkable for the number and beauty of the species. The molluscs, crustaceans, echinoderms, sponges, and corals of the Mediterranean are very numerous, but seldom differ specifically from those of the Lusitanian and West African regions, from the former of which, especially, its fauna appears to have been a colony.*

Ethnography.—From the earliest dawn of history, Italy contained a number of distinct races. Who were its earliest inhabitants, and from what country they entered the peninsula, are questions still involved in great obscurity. It is pretty generally allowed, however, that the aborigines of the south, who are known by the various names of Pelasgi, Siculi, Œnotrians, and Itali, were a Sanscritic race, and allied to the Celts, Teutones, and Sclaves, the earliest settlers in Western and Northern Europe; that they entered Italy from the north, at various times, from 2000 to 1350 B.C.; and that they were subsequently driven southwards by the Etruscans, Ligurians, and other tribes of uncertain origin. In 753 B.C. Rome was founded, according to some, by the descendants of a colony from Troy, and gradually extended its sway over the entire peninsula, and at length over the greater part of the whole world as known to the ancients. In the fifth century of our era the Goths invaded Italy, and overthrew the Roman Empire. The Italian people of the present day are, therefore, a very mixed race, formed of the union of the aborigines with Greeks, Gauls, Goths, Germans, and Arabs.

Language. — The Grecian colonists, in common with all the other tribes above enumerated, came in the course of time to lose their original dialects; and, as early as the reign of Augustus, Latin was the spoken language of all Italy. The modern Italian, a soft, euphonious language, is more closely allied to the Latin than any other Greco-Roman tongue. Of its numerous dialects, which differ widely from each other, the Tuscan is the most refined and harmonious, being spoken by the educated

* The Lusitanian region of marine life embraces the eastern side of the Atlantic from the N.W. of France to the Canary Isles, and lies between the Celtic and African regions. —(See p. 104.)

classes in all parts of the peninsula, and having been long the almost exclusive channel of Italian literature.

Religion and Education.—The entire population of Italy, with the exception of 25,000 Waldensian Protestants in Piedmont, who, after ages of persecution, are now allowed freedom of worship, belongs to the R. Catholic Church. Until the recent revolutions, when the Pope's temporal power was so terribly shaken, no other form of worship was tolerated in any part of the peninsula. Now, however, this state of things is changed considerably for the better; Protestants are allowed freedom of worship in all the cities and towns of the Kingdom of Italy, while even in the States of the Church a limited degree of toleration exists, and Protestants are allowed to meet for worship outside the walls of Rome. The education of the people is also better attended to. Formerly very few of the peasantry could either read or write, except in Sardinia, which for many years has formed an honourable exception to the general rule. But now common schools are beginning to appear in all directions; newspapers and railways are on the increase, and, above all, the Word of God in the vernacular may now happily be seen in multitudes of villages and hamlets throughout the peninsula. Previous to the revolution of 1860, there were five universities in the kingdom of Sardinia—viz., those of Turin, Genoa, Cagliari, Sassari, and Pavia; in Tuscany, three—those of Pisa, Florence, and Siena; in the Pontifical States, four—the University of Rome, the University of Bologna, the Collegio Romano, and the Collegio de Propaganda Fide; in Naples, three —those of Naples, Palermo, and Catania. To these are now to be added the Universities of Pavia in Lombardy, and Padua in Venetia.

National Character.—The modern Italians are described as "a handsome, lively, and intelligent people. The men are well formed, rather slim than stout, but strong and agile, with a dark complexion, expressive countenances, dark sparkling eyes, and, generally, black hair. The women have narrow foreheads, black or dark-brown hair, large, brilliant, and expressive eyes, a beautiful nose, which, with the forehead, forms the elegant Roman profile; but the lower classes, in consequence of living wholly on vegetable food, and of hard labour under a burning sun, rarely display any peculiar attractions. The prominent traits of the Italian character are love of ease and pleasure, and an inborn capacity for appreciating the beautiful in every department of art, which has rendered their country the chief school for sculpture, painting, and music."

Literature.—From the splendid galaxy of literati which for ages has illumined this classic country we can only instance a few of the most conspicuous stars:—

CLASSICAL LITERATURE: Plautus, Terence, Lucretius, Cicero, Cæsar, Virgil, Horace, Livy, Ovid, Sallust, Nepos, Juvenal, Pliny, Tacitus, Quintilian. SACRED LITERATURE: Gregory the Great, Thomas Aquinas, Cajetan, Baronius, Bellarmine, Paolo Sarpi, Pallavicini, Martini, Diotati, De Rossi, Cardinal Mai. POETRY: Dante, Petrarch, Boccaccio, Pulci, Boiardo, Ariosto, Berni, Colonna, Guarini, Tasso, Metastasio, Alfieri, Foscolo, Parini. HISTORY: Platina, Machiavelli, Varchi, Davila, Guicciardini, Bentivoglio, Strada, Maffei, Muratori, Lanzi, Vasari, Denina, Tiraboschi, Farini, Vico. PAINTING: Cimabue, Leonardo da Vinci, Michael Angelo, Berretini, Battoni, of the *Florentine School.* Raphael,

Giulio Romano, Barocci, Sacchi, Claude of Lorrain, Poussin (Gaspard), of the *Roman School*. Titian, Paolo Veronese, Canale, of the *Venetian School*. Correggio, Caracci, Guido, Grimaldi, Colonna, of the *Lombard and Bolognese School*. SCULPTURE: Niccola Pisano, Donatello, Cellini, Bernini, Algardi, Michael Angelo, Canova. MUSIC: Palestrina, Farinelli, Paganini, Lully. SCIENCE AND PHILOSOPHY: Cardan, Vanini, Galileo, Toricelli, Malpighi, Cassini, Morgagni, Galvani, Volta, Melloni. TRAVELS AND DISCOVERY: Christopher Columbus, Amerigo Vespucci, Marco Polo. MISCELLANEOUS LITERATURE: Poggio, Laurentius Valla, Politian, Pico Mirandola, Bembo, Aldo Manuzio, J. C. Scaliger, Marana, Gravina, Crescimbini, Facciolati, Forcellini, Beccaria, Filangieri.

Government and Finance.—With the exception of Sardinia, which has enjoyed free institutions since 1848, all the Italian states had for generations been groaning under despotisms of the most extreme type. Civil and religious liberty were everywhere unknown; and freedom of worship, freedom of speech, freedom of the press, and liberty of the subject, effectually suppressed. The inextinguishable love of liberty, however, in the bosoms of the people, stimulated by the example and influence of Sardinia, broke out at length in a general revolution, which terminated in hurling the despots from their thrones.

In 1859, Lombardy was wrested from Austria and ceded to Sardinia; in the following year Parma, Modena, and Tuscany, having expelled their sovereigns, also attached themselves to that state; while still more recently, Garibaldi, a Sardinian general, raised the standard of revolt in Sicily, crossed the Strait of Messina, overran the Neapolitan territories and the Pontifical States, and thus laid all the remainder of Italy, with the exception of Rome and Venetia, at the feet of Victor Emmanuel. Finally, Venetia was ceded by Austria at the termination of the Continental war of 1866. The legislative authority rests conjointly in the king and parliament, the latter consisting of two chambers—viz., the Senate, which consists of 283 life-members nominated by the king; and a Lower House, elected by citizens above 21 years of age, at the rate of one deputy to every 40,000 of the population. The executive is vested in the king, who acts through responsible ministers. In the Papal States, the Pope is regarded theoretically as autocratic, though in practice he is assisted by the cardinals. The Italian army, in 1869 (on the peace footing), numbered 183,441 officers and men, besides 197,000 in the reserved force. The navy consists of 106 vessels of war, carrying 1468 guns. The papal army consists of about 15,670 men and 1206 horses. The Revenue of the Kingdom of Italy, for 1868, amounted to £31,198,600, the Expenditure to £39,918,600, and the Public Debt to £250,000,000, requiring an annual interest of £15,000,000 sterling. The Revenue of the Pontifical States is about £1,287,000, the expenditure to considerably more, and the Public Debt to £19,166,600.

Manufactures and Commerce.—Manufacturing industry is still at a low ebb in all parts of the peninsula, notwithstanding the great political changes that have recently taken place. A liberal constitutional government, favourable to free-trade and moderate tariffs, with the many other advantages resulting from the incorporation of the numerous states formerly existing in the country into one king-

dom, cannot fail to inaugurate a new era in the commercial and manufacturing history of the country.

Generally speaking, Italian workmen are inferior to those of other European countries. Their leading characteristic is that their efforts are more directed to the production of articles of luxury than to those of utility. Among textile fabrics, silks and velvets are the most important, especially in northern and central Italy. By far the greater part of the raw and thrown silk imported into England from France is not produced in that country, but in Italy. The annual value of the silk crop is estimated to exceed £10,000,000. Besides these, woollen textures for home consumption are manufactured in Sardinia; paper and straw-plait in Tuscany; leather, gloves, musical instruments, glass wares, cordage, wine, and soap, in central Italy, where also sulphur and salt are prepared for exportation; while in Naples the principal articles, besides silks, are woollens, linens, hosiery, straw-hats, sausages, macaroni, essences, perfumery, glass, soap, musical strings, filigree-work, and coral ornaments. The manufactures of Venetia are very various. The famous glassworks of Venice produce magnificent mirrors, with every variety of artificial pearls and gems, beads, enamel, and mosaic works, &c.; while jewellery, gold and silver stuffs, velvets, silks, laces, soaps, and wax-lights, are extensively manufactured. The commerce is considerable, is rapidly increasing, and is chiefly carried on with Great Britain, the south of Europe, and the Levant. Fully two-thirds of the foreign trade of Venice is carried on under the British flag. The chief articles of exportation are silks, olive oil, wines, sulphur, borax, fruits, oak and cork bark, anchovies, macaroni, essences, soap, and the other articles above enumerated; while the principal imports are cotton stuffs, iron, steel, hardware, and coal, from Great Britain; wool from the Levant; corn from Odessa; and wines from France and Spain. In 1868, Britain sent to Italy goods to the value of £5,946,029, and received in return goods to the value of £4,019,582. The imports from France into Italy average £8,000,000 sterling, and the exports from Italy into France are about equal in value. Next in order to France and Britain, but far below, come Austria and Switzerland. The commercial marine of the Kingdom of Italy, in 1868, comprised 17,788 vessels, carrying 815,521 tons; while that of the Papal States amounted to 315 vessels, carrying 5232 tons.

Internal Communication.— Owing to the want of energy on the part of the people, their abject poverty, and the innumerable discouragements to which they have been subjected by their rulers, the great thoroughfares of commerce are still in a backward condition.

Till very recently *Railways* were almost unknown in the peninsula, the total number of miles open for traffic, in 1858, being only 700—viz., for Sardinia 390 miles, for Parma and Modena 96 miles, for Tuscany 150 miles, and for Naples 64 miles. Of late years, however, the railway system has made rapid progress throughout all parts of the peninsula. In 1869, there were 3331 miles open for traffic in the Kingdom of Italy, besides 180 miles in the Pontifical States. The most important line is the Mont Cenis railway, which forms the shortest route from Paris to Alexandria, and which at present carries our East-Indian mails. Beginning at M. Cenis, it follows the course of the Po to Piacenza, thence to Rimini on the Adriatic, the coast of which it traverses to Otranto, in the "heel of the boot." Lombardy abounds with *Canals*, but they are mostly used for the purposes of irrigation, the principal exceptions being

the canal from Milan to the Ticino, probably the oldest canal in Europe, and that from Milan to Pavia. Venetia abounds with canals, which in general are very short. In Tuscany there is a canal from Pisa to Leghorn, another from Pisa to the Serchio, uniting the Arno with the Serchio; and a third, named the Chiana canal, 37 miles in length, uniting the sources of the Arno and Tiber. In Venetia and Piedmont the roads are well constructed and kept in good repair; but in central and southern Italy they are in a most wretched condition. There are no good roads leading across the Apennines, notwithstanding their moderate elevation, and they are in general not available for wheeled carriages. For the various mountain-passes leading from Italy across the Alps, see p. 289.

GREECE.

Position and Boundaries.—The Kingdom of Greece is bounded on the N. by European Turkey; W., by the Ionian Sea; S., by the Mediterranean; and E., by the Ægean Sea or Archipelago, which separates it from Asia Minor. The continental portion lies bet. lat 36° 23′ and 39° 30′ N.; and bet. lon. 20° 45′ and 24° 7′ E.

Athens, the capital, near the centre of this area, is on the same parallel of latitude as the Azores, Cordova, Mount Etna, Smyrna, Tabriz, Astrabad, Yarkand, Tsi-nan, San Francisco, and Washington; and on the same meridian as Hammerfest, Mittau, Lemberg, Widdin, Derna (in Tripoli), and Cape Delgado. The form is extremely irregular, being broken up by straits and deep inlets of the sea into a series of peninsulas and islands, which stand to Europe in the same relation as Europe does to Asia. Extreme length of the continental part, 200 miles; breadth, on the parallel of Athens, 170 miles. Surrounded by the sea on three sides, and stretching out between the three continents of the Old World, Greece was the most favourably situated of all ancient countries, not even excepting Palestine. In proportion to its area, the coast-line greatly exceeds that of any other country, being estimated at one mile of seaboard to every seven miles of surface. The surface, however, is highly mountainous, while the centre of the Morea forms an elevated plateau.

Area and Population.—The area of Greece, including the Ionian Islands, ceded to it by Great Britain in 1864, amounts to 20,152 sq. m., or two-thirds the size of Scotland. The population, in 1861, was 1,348,522, or somewhat more than two-fifths the population of the latter country. This area gives nearly 67 persons to each sq. m. Ancient Greece, including Epirus and Thessaly, is supposed to have contained at one time 3,500,000 inhabitants.

Political Divisions.—Previous to 1830, and whilst Greece was under the yoke of Turkey, the country was divided into three provinces—viz., Livadia in the N., Tripolitza in the S., and the Archipelago in the Ægean Sea. In 1838 it was divided into twenty-four governments, twelve of which were in the Morea, eight in Hellas,

while the remaining four comprised the Cyclades and Sporades. But in 1845 the whole country was divided into the following ten *nomes* or governments :—

HELLAS OR NORTHERN GREECE.

Acarnania and Ætolia.—Mesolonghi 6 (G. of Patras), Vonitza 3 (G. of Arta), Lepanto 3 (G. of Lepanto).

Phthiotis and Phocis.—Lamia 5 n. (G. of Lamia), Salona 6, Castri n. (Bay of Salona), *Thermopylæ* (Hellada).

Attica and Bœotia.—ATHENS 41, Piræus 6 (G. of Ægina), Thebes 9 (Asopo), Livadia 9 n. (L. Topolias), *Marathon* (E. Co. of Attica).

Eubœa or Negropont.—Negropont 5 (Chan. of Talanta), Karysto 3 (Chan. of Egripo).

THE MOREA.

Argolis and Corinth.—Nauplia 6, Argos 9, Spezzia 10, Hydra 10 (G. of Argolis), Corinth 2 n., Vostitza 3 (G. of Lepanto).

Achaia and Elis.—Patras 18 (G. of Patras), *Olympia* (Rufia).

Messenia.—Calamata 6 (Nedon), Cyparissia 3, Navarino 2 (W. Co.)

Laconia.—Sparta 2, Mistra 2 (Eurotas).

Arcadia.—Tripolitza 7 (Roufia).

THE ISLANDS.

Cyclades.—Syra 18 (I. Syra), Andros 5 (I. Andros), Naxia 5 (I. Naxos).

Ionian Isles.—Corfu 25 (I. Corfu), Argostoli 5 (I. Cephalonia), Zante 25 (I. Zante), Amaxichi 7 (E. Co. Leucadia).

Descriptive Notes.—The towns of Greece are all very small; of the above enumerated perhaps not more than twenty exceed 5000 of population; five exceed 10,000; while only three exceed 20,000.

Mesolonghi, a small fortified town, which greatly distinguished itself in the war of independence: here Lord Byron died in 1824. **Lepanto** or **Nepakto**, near which the fleet under Don John of Austria totally defeated that of the Turks in 1571. **Lamia** or **Zeitoun**, near the famous pass of Thermopylæ, where Leonidas, with his 300 Spartans, fell in opposing the Persian invaders under Xerxes, B.C. 480. **Salona**, at the southern base of Mount Parnassus: on its acropolis are picturesque ruins of its ancient citadel. **Castri**, near the famous Castalian Spring: here stood the celebrated temple of Apollo, the principal seat of his worship: here were celebrated the Pythian games; and it was one of the two places of meeting of the Amphictyonic Council. **Athens**, capital of the kingdom of Greece, is one of the most celebrated cities in the world, and the most renowned for its literature, science, and fine arts. It is extremely ancient, having been founded, at least in part, by Cecrops, a hero of the Pelasgic race, B.C. 1556. It was burnt by Xerxes B.C. 480, but was soon rebuilt by Themistocles, and not many years later it was adorned by Pericles with the most splendid architectural works the world has ever seen. The splendour of Athens, however, chiefly consisted in its public buildings, for the private houses, even those of its greatest men, were insignificant, and

the streets narrow and irregular. The city suffered severely during the siege of Sulla, B.C. 86. Hadrian embellished it with many splendid public buildings, A.D. 123. Alaric, king of the Goths, in A.D. 396, reduced it almost to a heap of ruins. Since then it has belonged successively to Goths, Byzantines, Burgundians, Franks, Catalans, Florentines, Venetians, Turks, and Greeks. During the greater part of the middle ages it was an almost deserted place; but in 1833 it became the seat of the Greek Government. Athens was the birthplace of many illustrious persons, among whom may be mentioned Socrates, Plato, Phidias, Pericles, and Alcibiades. **Piræus**, the port of Athens on the Gulf of Ægina, contains the tomb of Themistocles. **Thebes** or **Thiva**, one of the most ancient cities in Greece, founded by Cadmus about B.C. 1551, and at one time a place of great wealth and importance. Here Cadmus the Phœnician first introduced the use of letters into Europe. It was the birthplace of Hesiod, Pindar, Pelopidas, and Epaminondas. It was the scene of the tragic fate of Œdipus, and of the war of "the seven against Thebes." **Livadia**, the capital of Hellas under the Turks. **Marathon**, a hamlet situated in a plain watered by the Charadrus. In this plain was fought the celebrated battle between the Persians under Datis, and the Athenians under Miltiades, B.C. 490. **Negropont** (Egripos) a maritime town, and capital of the island Eubœa. It is a very ancient town, and planted numerous colonies, among which were Cumæ in Italy, and Naxos in Sicily. It was also a place of great military importance, as it commanded the navigation between the north and south of Greece. Here Aristotle died, B.C. 322. **Nauplia**, on the Gulf of Argolis, is a strongly-fortified town, and one of the most important in modern Greece. **Argos**, long the capital of Argolis, is considered the most ancient city of Greece. **Corinth**, once a great and opulent city, and the emporium of the trade between Europe and Asia, is now reduced to but a mere village, exporting currants, wheat, oil, honey, and wax. Its citadel, on a hill 1500 feet high, would, if properly fortified, be one of the strongest fortresses in the world. Its navy was numerous and powerful: here the first triremes were built; and the first sea-fight on record was between the Corinthians and their colonists the Corcyræans. **Spezzia**, beautifully situated on an island of same name in the G. of Argolis, is remarkable for the salubrity of its climate. **Hydra**, an important commercial town, situated on a barren rock in an island of same name. **Patras**, a fortified seaport, and the principal seat of the foreign trade of Greece. **Olympia**, the name of a small plain, where the famous Olympic Games were celebrated from the earliest times; but the Olympiads were not employed as a chronological era till the victory of Corœbus in the foot-race, B.C. 776. **Calamata**, near the head of the Gulf of Koron, maintains a brisk trade in oil, silk, and figs, and is the seat of the bishopric of Messenia. It was burnt by Ibrahim Pasha in 1825, but has been rebuilt. **Navarino**, a fortified seaport town, is chiefly celebrated in modern times for the victory of the English, French, and Russian fleets over those of the Turks and Egyptians in 1827. **Sparta**, after long lying desolate, is now being rebuilt, and has become the capital of Laconia. In ancient times it was the chief city in the Peloponnesus, and one of the most famous in Grecian history. **Tripolitza**, the capital of the Morea under the Turks, was stormed and taken by the Greek insurgents in 1821, and again by the troops of Ibrahim Pasha in the same year, who razed it to the ground: but it has been since rebuilt. **Syra** or **Hermopolis**, the principal commercial city in Greece, and the residence of consuls of most European States. THE IONIAN ISLES.—**Corfu**, capital of the late republic of the Ionian Isles, has been strongly fortified by the British

Government, and is the seat of a university. **Zante**, a thriving town, and capital of the most fertile and densely peopled of all the Ionian Islands.

Capes.—Punta and Scropha, W. of Hellas; Klarenza, W. of the Morea; Gallo, Matapan, and Malea, S. of the Morea; Skillo, E. of the Morea; Colonna and Doro, S.E. of Hellas.

Punta, the ancient *Actium*, off which Augustus gained the great naval victory over Anthony and Cleopatra. *Colonna* (ancient Sunium), so named from the splendid temple of Athena which crowned its brow, the *columns* of which still exist.

Islands.—The islands are very numerous, and consist of four leading groups. 1. The Ionian Isles, W. of Greece, the principal being Corfu, Santa Maura, Cephalonia, Zante, and Cerigo. 2. Negropont or Eubœa, E. of Hellas, and the largest island in Greece. 3. The Cyclades, between the Morea and Asia Minor, principal—Andros, Tinos, Naxos, Paros, Syra, Zea, Thermia, Serfo, Siphanto, and Milo. 4. The Sporades, or "scattered islands," partly in the Gulf of Egina, and partly N.E. of Negropont.

Gulfs and Straits.—Gulf of Arta, N.W. of Hellas; Patras and Lepanto, between Hellas and the Morea; Koron, Laconia, and Argolis, S. of the Morea; Egina, between Argolis and Attica: Channels of Egripo, Talanta, and Trikeri, between Eubœa and the mainland.

Surface and Mountains.—The surface is almost wholly mountainous, but the hills are interspersed with fine valleys and a few plains of limited extent. The centre of the Morea forms an elevated plateau enclosed by three mountain-chains, one of which runs parallel to the deeply-penetrating Gulf of Lepanto, which is supposed to have been formed, at a remote age, by an earthquake.

The mountains of Hellas are a continuation of Mount Pindus, which separates Thessaly from Albania. On arriving at the Grecian frontier it separates into two branches, one of which (Mount Othrys) forms the boundary between Thessaly and Greece, and separates the basins of the Salembria and Hellada: highest summit, 5679 feet. The other branch pursues a S.E. direction to Cape Colonna in Attica, and is thence prolonged through the western chain of the Cyclades to Santorini. It consists of two minor ranges—viz., the Oeta range in the N., about 7000 feet high, but containing Mount Guiona, the culminating-point of Greece (8783 ft.), separated from the Othrys range by the basin of the Hellada; and the Parnassus range in the S., separated from the Oeta range by the basin of the Gavrios, and from the Morea by the Gulf of Lepanto: highest summits—Mount Parnassus, 8068 ft.; Mount Helicon, 4963 ft.; Mount Cithæron, 4630 ft.; Mount Hymettus, 3370 ft. A branch from Mount Cithæron proceeds along the Isthmus of Corinth into the Morea, and there ramifies into three small chains, which support between them the table-land of Arcadia: highest summits, Mount Taygetus or St Elias, 7903 ft.; Cylene or Ziria, 7788 ft.; Malevo, 6355 ft. None of the mountains of Greece fully reach the line of perpetual congelation, though several of them closely approach it.

Rivers and Lakes.—Owing to the peninsular character of the country, and the numerous deep indentations of the surrounding

seas, none of the rivers of Greece attains to any considerable magnitude, the principal streams being the Aspropotamo (anc. *Achelōus*), the Fidaris (anc. *Evenus*), the Roufia (anc. *Alpheus*), the Basili-Potamo (anc. *Eurotas*), and the Hellada (anc. *Sperchius*). The only lake of importance is Lake Topolias (anc. *Copais*), in the east of Hellas, and even it is little more than a reedy marsh.

Climate. — The climate is in general warm and delightful, and only inferior to that of Italy.

The summer is extremely warm, the temperature often rising to 100° Fahr.; but it is greatly modified by sea-breezes. At this season rain seldom falls; the smaller rivers are dried up; the air is remarkably clear, not a cloud being seen for several weeks. In autumn rain becomes frequent and copious, and the streams fill their channels. Winter does not exceed two months' duration, and is marked by rain in the plains and snow in the mountains, the latter retaining their covering till summer is far advanced, though none of them attains the limit of perennial congelation. Snow appears in October, and continues to fall till April. In March the olive buds and the almond is in blossom, while grain is ready for the sickle in May. The mean temperature of the whole country ranges from 64° in the S. to 59° in the N. Mean temperature of Athens 60°, winter 41°, summer 77°.

Geology and Minerals.—Crystalline rocks cover the south-eastern part of the Morea, as also Attica, Eubœa, the Cyclades, and Sporades. Tertiary strata line the western side, from the Gulf of Arta to Navarino in the Morea. The entire remainder is occupied with secondary rocks, which are chiefly of limestone, and hence the numerous caverns, subterranean rivers, and fissures emitting mephitic vapours, which ministered so largely to the mythology and poetry of the ancient Greeks: the limestone often assumes the form of the finest marble, which is extensively used for building and statuary. Volcanic rocks, though not found in the mainland, form considerable masses in some of the islands, one of which (Santorini) is indeed only a recently-extinct volcano. The *Mineral* treasures of Greece are considerable, though very sparingly worked. Marble is abundant, together with salt, sulphur, saltpetre, lignite, asbestos, mill-stones, whetstones, serpentine, fuller's earth, porcelain earth, argentiferous lead, and traces of gold. The mainland is singularly devoid of metals, but iron is found in Eubœa and some other islands; and coal occurs in Eubœa, Corfu, and the Morea. Wells of petroleum, which were known to Herodotus, still exist in Zante.

Botany and Agriculture.—The botany of Greece considerably resembles that of Southern Turkey and Albania. Dr Sibthorpe, in his 'Flora Græca,' enumerates 850 species, which he collected principally in Attica and Beotia. Most of our finer garden-flowers grow wild in Greece, as the Hyacinth, Ranunculus, Tube-rose, Narcissus, Iris, and Anemone. The natural vegetation of the country, from the sea-level to the height of 1500 feet, exhibits as great a variety of valuable trees, shrubs, and plants as can be found in an equal extent of country anywhere throughout the world. Among the most important and useful may be reckoned the olive, vine, orange, lemon, prickly

fig, almond, the date-palm (in Attica), the currant grape of Corinth, which is a species of vine yielding the currants of commerce, the citron, pomegranate, and banana. The water-melons and gourds are excellent. At elevations less than 1600 feet, the myrtle, mastich, and plane-tree flourish; while the mountains are covered with forests of pine.

Agriculture.—Only about a tenth of the surface is under cultivation, and the arable land is of very limited extent. A great part of the soil is of a thin and by no means fertile nature. Agricultural implements and operations are of the most primitive description, and the grain raised is only about two-thirds of that required for home consumption. The plough in use differs in no respect from that described by Hesiod, nearly 3000 years ago. The principal crops are—wheat, barley, maize, rice, coffee, tobacco, cotton, madder, flax, and figs; but the olive takes precedence of all others, both soil and climate being particularly favourable to its growth. The soil in most parts of Greece and the Ionian Islands is admirably fitted for the culture of the vine, which in ancient times formed a highly important article of industry; but owing to the misrule and rapacity of the Turks, for four centuries its cultivation was almost totally abandoned. It is now beginning to revive, and will, doubtless, ere long resume its proper place in the markets of Europe. Tino, one of the Cyclades, is famous for its Malmsey wine, and Sikind and Santorin produce wines of good quality. The cultivation of the mulberry has also of late been greatly extended.

Zoology.—The most common wild *Quadrupeds* are the bear, lynx, wildcat, boar, stag, roebuck, goat, badger, marten, wolf, fox, weasel, jackal, hare, and hedgehog. *Birds* comprise the vulture, falcon, owl, cuckoo, roler, kingfisher, teal-duck, stork, partridge, pigeon, quail, snipe, blackbird, goldfinch, nightingale, swallow, marten, flamingo, and pelican. The domestic animals are of inferior breeds, and the ass is almost the only beast of burden. Sheep are very numerous, and form, with goats, the only animals from which dairy produce is obtained. Bees are extensively reared, and honey is largely exported.

Ethnography.—The people of modern Greece are a mixed race, the pure blood of the Pelasgians having, in the course of ages, become largely intermixed with Sclavonic, Teutonic, and even Turkish elements. In some parts of Northern Greece, as also in the northern and eastern parts of the Morea, and some of the islands, Albanians constitute the majority of the inhabitants.

Language.—The ancient Greek formed one of the principal members of the Greco-Latin branch of the great Indo-European family. Modern Greek or Romaic differs as little from the ancient as some of the dialects of the latter differed from each other; and greatly more resembles it than the Romanic languages (French, Italian, and Spanish) do the Latin. (See p. 90). The Albanians also continue to speak the ancient language of their Illyrian progenitors, who seem to have formed a connecting-link between the Sclavonic and Greco-Latin races.—(See under "Turkey.")

Religion.—Nine-tenths of the population belong to the Greek or Eastern Church, which separated from the Western, A.D. 862. It mainly differs from the latter in not recognising a Vicar of Christ; in denying the in-

fallibility of ecclesiastical councils; in administering the Eucharist in two kinds; in denying the doctrine of purgatory and the adoration of images, (though that honour is freely conceded to paintings of the Deity, of the Virgin Mary, and of other saints); and, finally, in the celibacy of the clergy, and the use of the Scriptures by the laity. Roman Catholics are numerous in the Ionian Isles and the Cyclades, and enjoy, with other sects, a limited amount of toleration.

Education is in a backward state, but strenuous efforts are made by the state to improve it. Besides the Universities of Athens and Corfu, there are gymnasia at Athens, Nauplia, Patras, Syra, and Hydra; together with normal, polytechnic, and naval schools. Indeed, every important town has its gymnasium, and every village its common school.

Literature.—The literature of Greece, the most copious and brilliant in the history of our race, belongs almost exclusively to ancient times, and every scholar is more or less familiar with it. Of the few names contained in the following list, several were not natives of Greece:—

POETS: Homer, Hesiod, Tyrtæus, Sappho, Anacreon, Pindar, Æschylus, Sophocles, Euripides, Aristophanes. HISTORIANS: Herodotus, Thucydides, Xenophon, Polybius, Diodorus Siculus, Diogenes Laertius, Plutarch. ORATORS: Empedocles, Gorgias, Isocrates, Demosthenes, Æschines, Hermogenes, Longinus. PHILOSOPHERS: Thales of Miletus, Anaximander, Anaximenes, Anaxagoras, Pythagoras, Heraclitus, Democritus, Socrates, Plato, Aristotle, Epicurus, Zeno, Plotinus. MATHEMATICIANS AND ASTRONOMERS: Eudoxus, Euclid, Eratosthenes, Archimedes, Apollonius, Hipparchus, Ptolemy, Diocles, Proclus, Isidorus, Diophantus. GEOGRAPHERS: Posidonius, Strabo. PHYSICIANS: Æsculapius, Hippocrates, Herophilus, Galen. FINE ARTS: Agelādas, Myron, Phidias, Polycletus, Polygnotus, Apelles, Aristides.

Government, &c.—Greece, which had for ages groaned under the yoke of Turkey, revolted against that power in 1821; and after a long and severe struggle, in which it was aided by the European powers, secured its independence in 1829. In 1832 Otho, second son of the King of Bavaria, was appointed king, but abdicated in 1862, after which Prince George of Denmark accepted the crown. The government, at first nearly absolute, became, after the revolution of 1843, a constitutional monarchy. The executive is vested in the king and his responsible ministers, assisted by a council of state. The Chamber of Deputies, who are chosen by universal suffrage, consists of 170 members. The army, in 1867, amounted to 31,300 men and officers, including 17,000 of a reserved force. The navy embraced 2 frigates, 2 corvettes, and 6 steamers, carrying 164 guns. The estimated Revenue, for 1870, amounted to £1,218,000; the Expenditure to £1,210,000: and the Public Debt to £13,800,000.

Commerce and Manufactures.—The chief resource of the inhabitants of Greece consists in their maritime commerce. The Greeks are expert mariners; the great extent of coast-line gives them many facilities for maritime pursuits; and they have for a long time been the principal agents in conducting the commerce of the eastern part of the Mediterranean. In 1869, the total number of vessels that

entered and cleared the ports of Greece was 95,066, carrying 3,562,954 tons. Of these, 638, with a tonnage of 321,997, were British. The principal ports are the Pirœus, Patras, Nauplia, Syra, and Corfu. The manufactures are few, and chiefly domestic, consisting of silk, cotton, and woollen stuffs; coarse pottery, leather, beetroot-sugar, and soap, are made in the principal towns; carpets, sail-cloth, and straw-hats in some of the islands: the women excel in embroidery, and dyeing in bright colours has been perpetuated from ancient times. Shipbuilding is also carried on at Syra, Lepanto, and other ports. The *Exports* embrace currants (the average annual value of which to Britain amounts to £700,000), cotton, olive-oil, wine, tobacco, wool, honey, wax, gum, silk, sponge, and valonia (a species of acorn used by tanners). *Imports:* manufactured goods (chiefly cotton from Great Britain), colonial produce, flax, timber, rice, drugs, &c.

Inland Communication.—The roads are few in number and of the most wretched description, except near the capital; and such as exist are infested with bands of robbers. A railway, however, now connects Athens with the Pirœus (being a distance of 5 miles), opened in 1869; while a canal is contemplated to cut through the Isthmus of Corinth.

TURKEY.

The Turkish or Ottoman Empire comprehends all the countries in which Turkish supremacy is directly or indirectly recognised. Its area and population are ill defined—the authority of the Sultan being little more than nominal in many extensive provinces. Its vast territories, though situated in the three continents which constitute the Old World, are strictly continuous, comprising a large territory in the extreme S. of Europe; another, three times as large, in the W. of Asia; and a third, of still greater dimensions, in the N.E. of Africa. It is bounded on the N. by the Transcaucasian provinces of Russia, the Black Sea, and the Hungarian provinces of Austria; on the W. by Dalmatia, the Adriatic and Mediterranean Seas, Algeria, and the Sahara; on the S. by Abyssinia and the Gulf of Aden; and on the E. by Persia and Transcaucasia. Lat. 11°—48° 5′ N.; lon. 7° 45′—48° 15′ E.

This wide expanse of territory, equal in dimensions to the most famous empires of antiquity, is intensely interesting to every reflecting mind. It is *geographically* interesting, as lying midway between the four great oceans, thus occupying the central area of the Old World. It is *historically* interesting, as comprehending the scene of man's earliest history—his high origin, his happy Paradise, his early rebellion, and the first promise of his future restoration to fellowship with his Maker. Here the Antediluvians lived out their centuries of violence, and here the ark of Noah floated securely above that flood which exterminated the rebellious race; here the patri-

arch alighted to people afresh the desolate earth, and here his descendants attempted anew to oppose the decrees of Heaven;—here the most ancient empires were founded, the first cities built, the earliest arts cultivated, the temple of science founded, and the saving truths of revelation first published;—here wandered those pilgrim fathers who lived "as seeing Him who is invisible;" here their offspring were held in bondage, and the power of the Divine arm, working in their behalf, was revealed;—here was situated that "good land" which the Most High had kept in reserve for His peculiar people, "when He divided to the nations their inheritance, and separated the sons of Adam;" here seers prophesied, and inspired bards sang;—here God tabernacled amongst men, and the Son of God assumed the human form; here He suffered and died for man, and laid the foundations of a kingdom that is destined ere long to embrace all the tribes of ruined humanity. The capital of this vast empire is Constantinople, situated on the strait which separates the European from the Asiatic provinces, and containing above a million inhabitants. The administrative divisions are into *eyalets, paschalics,* or *governments,* each of which is governed by a Pasha or viceroy, and into *livas* or *provinces,* the governors of which are called Kaïmmakams, and sometimes Beys. The empire is said to consist of 29 eyalets, 12 of which are in Europe and 17 in Asia. The Turkish possessions in Africa are not called *eyalets,* but tributary states. Turkey in Europe contains 200,928 sq. m.; population, 16,437,510; Asiatic Turkey, 672,000 sq. m.; pop., 16,463,000; African possessions, 1,049,181 sq. m.; pop., 9,165,000—total, 1,922,109 sq. m.; pop., 42,065,510.

Historical Sketch.—The Ottoman Empire was founded at Prusa, in Bithynia, in A.D. 1298, by Osman or Othman I., surnamed Elghazi, or the Victorious. In 1353, the Turks first entered Europe, under Soliyman, who crossed the Hellespont and landed at Gallipoli. In 1360, Amurath I. overran Eastern Europe, from the Danube to the Adriatic. Adrianople became the capital of European Turkey in 1362, and Constantinople was captured by Mahommed II. in 1453, thus terminating the Byzantine or Eastern Roman Empire. Servia was conquered in 1458, Moldavia in 1476, Egypt in 1516, Belgrade in 1521, Rhodes from the Knights of St John in 1522. Hungary became subject to the Turks by the battle of Mohacz in 1526, when Louis of Hungary was slain. Cyprus was ceded by the Venetians in 1573, and Candia taken in 1669, after a 25 years' siege. In 1686, Buda was retaken by the Imperialists, and Hungary wrested from Turkey. Transylvania was lost in 1699. Montenegro was ceded to Turkey in 1718, by the peace of Passarowitz; but she lost the Crimea in 1774, Bessarabia in 1812, and, finally, Greece in 1829; while her only acquisition of late years has been the southern portion of Bessarabia, ceded to her by the Peace of Paris in 1856.

TURKEY IN EUROPE.

Position and Boundaries.—N., the Hungarian provinces of Austria; W., Dalmatia, the Adriatic, and the Ionian Sea. S., Greece, the Ægean Sea, and the Sea of Marmora; E., the Black Sea and Bessarabia. It lies between lat. 38° 57′ and 48° 5′ N., and between lon. 15° 54′ and 29° 40′ E., thus occupying more than 9° of lat. and nearly 14° of lon.

Constantinople (lat. 41°, lon. 29°), near the centre of the empire, is nearly on the same parallel as New York, Madrid, Naples, Bokhara, and Pekin; and nearly on the same meridian as St Petersburg, Alexandria, and Port Natal. Leaving out Moldavia, which stretches northward 180 miles beyond the frontiers of Wallachia, the physical configuration of the remainder approaches a trapezium or truncated pyramid, with the base resting on the Save, Danube, and the Eastern Carpathians, and having its two sides respectively washed by the Adriatic and Black Sea. The greatest length from W. to E. is 650 miles; the extreme breadth, from the Save to the frontiers of Greece, 400 miles. The coast-line is extensive, and stretches along five seas; total length about 1300 miles, of which the Adriatic embraces 200, the Ionian Sea 100, the Ægean Sea and Sea of Marmora 600, and the Black Sea 400. The harbours on the west side are inferior, but many of the others are excellent, especially the Golden Horn.

Area and Population.—The area of European Turkey, including the Suzerain or Tributary States of Roumania (Wallachia and Moldavia), Servia, and Montenegro, is estimated at 200,928 sq. m., or four times the size of England without Wales; while by the latest census (1845), the population amounted to 16,437,510, being 81 persons to each sq. m. In England there are 372 persons to the sq. m.; hence, though the advantages of climate and soil are wholly on the side of Turkey, England is 4½ times as densely peopled. The Suzerain provinces occupy an area of 69,634 sq. m., with a population exceeding 5 millions; while Roumania alone has an area of 46,708 sq. m., and a population of 3,864,848.

Political Divisions.—The European portion of the empire consists, as above described, of two main portions—Turkey Proper (including Bosnia, Herzegovina, Albania, Thessaly, Rumelia, Bulgaria, and Crete), and the Suzerain provinces of Roumania (Wallachia and Moldavia), Servia, and Montenegro, which are almost independent states.

Turkey Proper.

Bosnia and Turkish Croatia.—Bosna-Serai 70 (Migliazza), Zvornik 12 (Drin), Banialuka 15 (Verbas, *aff.* Save), Novi-Bazar 15 (Ibar).

Towns between 5000 and 10,000 inhabitants.—Travnik, Doboi, Juicza, Livno, Dubicza, Kliutch.

Herzegovina.—Mostar 12 (Narenta), Trebigno 10 (Tribinschucza).

Albania.—Scutari 24 (Boyana), Jacova 18 (Drin), Prisrend 25 (Riaka), Kroya 15, Tirana 10 (Jantra), Berat 12 (Ergent), Delvino 10 (Pistricza), Janina 25 (Lake Janina), Durazzo 10, Valona 8 (W. coast).

Podgoricza, Carbonara, Tepeleni, Mezzovo, Dulcigno, El Bassan, Argyro-Kastro, Arta, Prevesa.

Thessaly.—Larissa 25, Tricala 12 n. (Salembria).

Anbelakia, Pharsala.

Rumelia (Macedonia and Thrace).—Constantinople or Stamboul 1075 (Bosporus), Uskup 10 n., Kuprili 22, Istib 20 n. (Vardar), Vodena 12 (Vistritza), Monastir or Bitolia 30 (Tzerna), Salonika 70 (G. of Salonika), Seres 25 n. (Strymon), Adrianople 150, Philippopoli or Filibi 40, Tatar-

Bazardjik 10 (Maritza), Kirk-Kilissia 16 (Tearus), Selimnia 20, Eski-Sagra 20 n., Kazanlik 10 (Tondja), Gallipoli 50, Rodosto 40 (Sea of Marmora).

Pera, Alaklissi (*Pella*), Veria, Yenidja-Vardar, Servia, Neokhorio (*Amphipolis*), Kostendil, Dubnicza, Filibi (*Philippi*), Drama, Kavallo, Lagos, Enos, Demotika, Hirepoli, Erekli, Ainada, Burgas, Kossova, Jamboli.

Bulgaria.—SILISTRIA 23, Rustchuk 30, Sistova 20, Nicopoli 15, Widdin 25 (Danube), Tirnova 12 (Jantra), Sophia 30 (Isker), Shumla 60 (Kamtchik), Lescovitza 12, Nissa 16 n. (Morava), Rasgrad 15 (Ak-Lom), Varna 16, Baba-Dagh 10 (east coast).

Matshin, Hirsova, Rassova, Osman-Bazar, Eski-Djuma, Pravadi, Yeni-Bazar, Bergovacz, Samakov.

Crete.—CANDIA 30, Retimo 8, Canea 16 (N. coast).

SUZERAIN OR TRIBUTARY STATES.

Montenegro.—CETIGNE 1 n. (Boyana).

Servia.—BELGRADE 19, Semendria 12 (Danube), Pristina 12 (Ibar).

Kruschevacz, Kragojevacz, Passarovicz.

Wallachia.—BUCHAREST 122 (Dumbovitza), Ibrail 16, Giurgevo 11 (Danube), Ployesti 27 (Jalomnitza), Krajova 22 (Schyl).

Oltenitza, Tergovist, Kalefat, Tchernecz, Rimnik, Karakal, Foktchany.

Moldavia.—JASSY 66 n., Husch 13, Botuchany 27 (Pruth), Ismael 25, Galacz 26 (Danube), Roman 11 (Sereth), Berlat 13 (Berlat), Pietra 12 (Bistritza).

Reni, Kilia, Bolgrad, Adjiud, Baku.

Descriptive Notes.—European Turkey, including the Tributary provinces, contains only three towns (Constantinople, Adrianople, and Bucharest) above 100,000 inhabitants; five between 100,000 and 50,000 (Bosna-Seraï, Salonika, Shumla, Gallipoli, Jassy); twenty-three between 50,000 and 20,000; sixteen between 20,000 and 10,000; and eighty between 10,000 and 5000.

Bosna-Seraï, a large, well-built, and fortified city, and the entrepôt for the commerce of Turkey, Dalmatia, and Southern Germany. **Mostar**, capital of Herzegovina, noted for its ancient Roman bridge, which consists of a single arch 95 feet in span; has manufactures of swords and firearms, and exports hides, wool, and cattle. **Scutari**, once the most important town of Illyricum, and the residence of the Illyrian King Gentius, is now the capital of Albania, and the centre of a great inland trade. Its merchants are the principal traders in Western Turkey. **Prisrend**, the residence of the Turkish governor, contains numerous mosques, with manufactures of firearms which are much celebrated. **Kroya**, capital of a liva, has manufactures of arms: its castle, now demolished, was Scander Beg's residence. **Delvino**, a fortified town, beautifully situated on the Pistricza, and surrounded by plantations of olives and oranges. **Janina** or **Joanina**, has a melancholy celebrity from its connection with the infamous Ali Pasha, who reduced it to ashes in 1820: though since rebuilt, its commerce, which was once extensive, has greatly declined. In its vicinity once stood Dodona, the seat of the most celebrated oracle of antiquity. **Arta**, founded by a Corinthian colony B.C. 660, was the capital of the kingdom of Pyrrhus. It has manufactures of russia leather, and of embroidery which is brought to great perfection. **Prevesa**: near it the

ruins of Nicopolis, which was founded by Augustus in commemoration of his naval victory of Actium. **Larissa** or **Yenitcher**, once the capital of the Pelasgi, is an important manufacturing town, noted for its dyeworks. Near it **Satalge** (*anc.* Pharsalus), memorable for the decisive battle between Cæsar and Pompey, B.C. 48, which made Cæsar master of the Roman world. **Constantinople** (*Turk.* Stamboul, *anc.* Byzantium), a large and celebrated city, capital of the Ottoman Empire, and formerly of the Byzantine or Lower Roman Empire, occupies a triangular promontory of land between the Bosporus and its inlet, the Golden Horn. Its aspect, when approached by water, is of the most striking and beautiful description, exhibiting to view a crowd of domes and minarets, backed by the dark foliage of the cypress and other trees which shade the extensive cemeteries beyond the walls. The streets, however, are narrow and dirty, and are infested with dogs, which act as public scavengers. The most striking of the public buildings are the Seraglio, or imperial palace, which with its grounds occupies an area of three miles; the church of St Sophia, built by the Emperor Justinian, in the sixth century, now converted into a Mohammedan mosque; and the mosque of Achmet, a fine structure, with a beautiful marble pavement and six minarets. Manufactures unimportant, chiefly of morocco leather, saddlery, shoes, and meerschaum pipes. Byzantium was founded by Byzas, the leader of a Megarian colony, B.C. 658; was rebuilt by Constantine A.D. 330; was taken by the Crusaders in 1204, who retained it till 1261; and by the Turks in 1453, an event which marked the final extinction of the Roman Empire in the East. **Vodena** (*anc.* Edessa or Ægæ) was the ancient capital of Macedonia, and the place where its kings were interred: here Philip of Macedon was murdered by Pausanias, B.C. 336. **Monastir** or **Bitolia**, a principal entrepôt for the goods passing from E. to W. Turkey. **Salonika** or **Saloniki** (*anc.* Thessalonica), a large seaport, and the second commercial city in European Turkey; has a large trade in British produce, and numerous exports; it is a place of great antiquity, and is intimately connected with the travels and writings of St Paul. **Seres**, the centre of the cultivation of cotton in European Turkey. **Adrianople**, founded by the Emperor Hadrian, B.C. 378, was, next to Constantinople, the chief city of the Eastern Empire, and was the capital of the Ottoman Empire from 1366 to 1453. Next to the capital, it is the most populous city in European Turkey: it has an active commerce in manufactured goods, and numerous manufactures of silks, woollens, linens, dyeworks, and tanneries. **Philippopoli**, founded by Philip of Macedon: under the Romans, it was one of the most important towns of the country; has flourishing manufactures of woollen, silk, and cotton fabrics, leather, soap, tobacco, and a considerable transit trade. **Gallipoli**, the first European town taken by the Turks (1355), is now the principal station of the Turkish fleet; it is a place of great trade, and is noted for its leather. **Rodosto**, a fortified, large, and maritime city, with an important trade in corn, wine, and other commodities. **Silistria**, **Rustchuk**, **Sistova**, **Nicopoli**, and **Widdin**, commercial and fortified towns on the south bank of the Danube, and the scenes of numerous conflicts between the Turks and Russians. **Shumla**, occupying one of the principal passes of the Balkans, and strongly fortified, is reckoned one of the keys of the metropolis. It has been repeatedly attacked by the Russians, who have been as repeatedly repulsed. It has manufactures of tin and copper wares, silk goods, and leather. **Varna**, the principal port of Turkey on the Black Sea, and strongly fortified, is the place from which the Anglo-French army embarked for Sebastopol in 1854. **Cetigne**, cap. of Montenegro, is a mere village, situated

in an elevated valley. **Belgrade**, capital of Servia, a nearly independent principality, is a strongly-fortified city at the confluence of the Danube and Save, the entrepôt of commerce between Turkey and Austria, and the most western outpost of Mohammedanism in Europe. **Semendria**, a fortified town on the Danube, and the former residence of the Servian kings, now nearly in ruins. **Pristina** has the tomb of Sultan Amurath I. in the vicinity. **Bucharest**, capital of Rumania, is one of the principal entrepôts for the commerce between Turkey and Austria. Here was concluded the famous treaty of Bucharest, by which, in 1812, Bessarabia and a part of Moldavia were ceded by Turkey to Russia. **Ibrail** or **Brahilov**, a small fortified town on the Danube, and the chief port of the province. **Giurgevo**, opposite Rustchuk, of which it is the port. Here the Russians were defeated by the Turks in July 1854. **Krajova**, a flourishing commercial town, with an active trade in salt. **Jassy**, the provincial capital of Moldavia, and the residence of the hospodar or governor, covers a large area, the houses being interspersed with gardens. It maintains an active commerce in agricultural produce. **Ismael**, a strongly-fortified town, stormed by the Russians, under Suwarrow, in 1790, but ceded to Turkey in 1856. **Galacz**, the only port for the exports and imports of Moldavia, and the chief medium of commerce between Germany and Constantinople.

Capes and Islands.—Linguetta, on the W. coast of Albania; Paliuri, Drapano, and Monte Santo, the extremities of three peninsulas on the coast of Macedonia; Helles Bournu, at W. entrance of the Dardanelles; Emineh, N.E. of Rumelia; Kalagria, E. of Bulgaria. The ISLANDS belonging to Turkey are Crete, Scarpanto, and Caxo, at the mouth of the Ægean Sea; the Turkish Sporades (the chief of which are Lemnos or Stalymene, Imbros, Samothraki, Thaso, and Strati), in the N. of the Ægean Sea. The islands on the coast of Asia Minor, as Lesbos, Scio, Samos, Rhodes, and Cyprus, belong rather to the Asiatic portion of the empire.

Seas, Gulfs, and Straits.—The Adriatic and Ionian Seas, bet. Turkey and Italy; Ægean Sea, bet. Thessaly and Anatolia; Sea of Marmora, bet. Thrace and Anatolia; Black Sea, bet. European Turkey and Caucasia. Gulfs of Drin, Avlona, and Arta, W. of Albania; Str. of Otranto, joining the Adriatic and Ionian Seas; Channel of Corfu, between Corfu and Albania; Gulf of Volo, S.E. of Thessaly; Gulfs of Salonika, Cassandra, Monte Santo, Contessa, and Saros, S. of Rumelia; the Dardanelles or Hellespont, connecting the Ægean Sea with the Sea of Marmora; the Bosporus, or Channel of Constantinople, uniting the Sea of Marmora with the Black Sea; Gulf of Burgas, N.E. of Rumelia.

Surface and Mountains.—The greater part of the surface of European Turkey is an undulating region of hills and valleys, mountains and table-lands, of moderate elevation. There are three principal mountain-ranges, which divide the country into three almost equal climatic regions, and which form the great water-partings between the principal river-basins—viz., 1. The Western range, separating the basins of the Adriatic and Ionian Seas from those of the Danube and Ægean Sea; 2. The Balkan range, or Mount Hæmus, between the Danube and the Ægean Sea; and, 3. The Eastern Carpathians, between the basins of the Theiss and Lower Danube.

The *Western* or *Hellenic Range*, forming a continuation of the Julian Alps of Illyria, extending southward to the Grecian frontier, and separating the basins of the Adriatic and Ionian Seas from those of the Danube and Ægean Sea. This range is known as the *Dinaric Alps* in the north, and as *Grammos* or the *Pindus Chain* in the south: Mount Olympus, in the N. of Thessaly, the culminating point of the whole peninsula, 9749 feet, lies considerably E. of the range. The other loftiest summits are, Mount Dinara, in Croatia, 7458 feet; Mount Pindus, between Albania and Thessaly, 8950 feet; and Mount Ida, in Crete, 7674 feet. Height of snow-line on Mount Olympus, 9000 feet.

The *Balkan* or *Hæmus Range*, branching off at right angles from the Hellenic range, and extending eastward to Cape Emineh in the Black Sea, separates the basin of the Danube from that of the Ægean Sea. The Balkan proper, or principal chain, contains the highest summits of the range—viz., Tchar Dagh (anc. *Scardus*), in the N.W. of Macedonia, 9840 feet; Great Balkan, 8874 feet; Emineh Dagh, 7500 feet. A lateral range, named Despoto Dagh (anc. *Rhodope*), branches off southwards from the middle of the main range, separating the basins of the Maritza and Kara-su, and containing Rilo Dagh, 8318 feet, and Mount Athos, an outlier, 9628 feet.

The *Eastern Carpathians*, separating Wallachia and Moldavia from the Hungarian provinces of Austria, and the basin of the Theiss from that of the Lower Danube (see under "Austria").

Mountain-Passes.—Trajan's Gate and the Shumla Pass, in the Balkan range; the Iron Gate, Vulcan Pass, Rothenthurm Pass, Boza Pass, in the Carpathians, between Wallachia and Transylvania; Gymes Pass, between Moldavia and Transylvania.

Principal River-Basins. — The rivers of European Turkey are naturally divided into three groups—viz., those flowing westward to the Adriatic and Ionian Seas; those flowing southward to the Ægean Sea and Sea of Marmora, the principal of which are the Vardar, 170 miles in length, and the Maritza, length 260 miles, area of basin 18,200 sq. m.; and those flowing eastward to the Black Sea, the principal being the Danube, 1795 m. long, area of basin 306,000 sq. m.

Table of Rivers and Towns.—The following table comprises 50 of the principal rivers of Turkey, of which 18 enter the sea directly and 32 indirectly. Though the Danube with its tributaries was given at length under Austria, we insert again here, for the convenience of the student, the portion of its basin belonging to Turkey.

Basins inclined to the Adriatic and Ionian Seas.

Rivers.	*Towns.*
Narenta, ...	*Poschitel*, MOSTAR.
Brigava, *l* ...	*Stolacz.*
Bistritza, ...	Imoschi, *Livno.*
Tribinschucza,	Trebigno.
Boyana, ...	SCUTARI, CETIGNE, n.
Moraka, ...	*Podgoricza.*
Drin, ...	*Alessio, Ochrida.*
White Drin,	Prisrend, n., Jacova.
Jantra, ...	Kroya, Tirana.
Scombi, ...	*El Bassan, Koridia.*

Rivers.	*Towns.*
Ergent, ...	Berat.
Vojutza, ...	Avlona or Valona, *Carbonara, Tepeleni, Konicza.*
Deropuli, *l* ..	*Argyro-Kastro.*
Pistricza, ...	Delvino.
Arta G. and R.,	*Prevesa, Arta*, Janina, *Mezzovo.*
Co. Albania, ..	*Antivari, Dulcigno*, Durazzo.

Basins inclined to the Ægean Sea.

Rivers.	*Towns.*
Salembria,	LARISSA, *Ambelakia*, Tricala, n.
Satalgo,	*Pharsala.*
G. of Salonika,	Salonika.
Karasu,	*Servia, Kastoria*, n.
Mauronero,	*Alaklissi, Yenidja-Vardar.*
Vardar,	Vodena, n., Istib, n., Kuprili, Uskup.
Tzerna,	Monastir.
Strymon,	*Neokhorio*, Seres.
Angites, *l*	Filibi, *Drama.*
G. of Kavallo,	*Kavallo.*
G. of Lagos,	*Lagos.*
Maritza,	*Enos*, n., Adrianople, Philippopolis or Filibi, Tatar-Bazardjik, *Kostanitz, Samakov.*
Erkeneh, *l*	*Hirepoli.*
Tearus,	Kirk-Kilissia.
Tondja,	Adrianople, *Jamboli*, Selimnia, Eski-Sagra, n., Kazanlik.
Dardanelles,	Gallipoli.
S. of Marmora,	Rodosto, *Erekli.*
Bosporus,	CONSTANTINOPLE, *Pera.*

Basins inclined to the Black Sea.

E. Co. of Rumelia,	*Midia, Ainada, Burgas.*
Kamtchik,	Shumla, *Eski-Djuma.*
Pravadi,	Varna, *Pravadi, Yeni-Bazar.*
Danube,	Baba-Dagh, Kilia, Ismael, *Reni*, Galacz, Ibrail, *Matshin, Hirsova, Rassova*, SILISTRIA, *Oltenitza, Turtukai*, Giurgevo, Rustchuk, Sistova, Nicopoli, Widdin, *Kalefat, Tchernecz*, Semendria, Pancsova, BELGRADE, &c.—(See under "Austria.")
Jalpuch, *l*	Ismael, *Bolgrad.*
Pruth, *l*	*Reni*, Husch, Jassy, n., Botuchany, n., Czernowitz.
Sereth, *l*	Galacz, *Adjiud*, n., *Baku*, Roman.
Berlat, *l*	Berlat.
Bistritza,	Pietra, *Bistritza.*
Jalomnitza, *l*	*Hirsova*, Ployesti.
Argish,	*Oltenitza, Terygovist, Argish.*
Dumbovitza, *l*	BUCHAREST.
Lom,	*Osman-Bazar.*
Ak-Lom,	Rasgrad.
Jantra,	Tirnova.
Alt or Aluta, *l*	Nicopoli, *Slatina, Rimnik*, Kronstadt, n.
Isker,	Sophia.
Schyl, *l*	Krajova.
Morava,	*Kragojevacz*, n., *Kruschevacz*, Lescovitza, Nissa, n.
Ibar,	Novi-Bazar, Pristina, *Kossova.*
Save,	BELGRADE, *Schavacz.*
Drin,	Zvornik, *Belina.*
Bosna,	*Doboi, Maglai*, Traunik, n.
Migliaz-Bosna-Seraiza,	
Verbas,	Banialuka, *Juicza.*
Unna,	*Gradiska, Novi, Bihacz, Dubicza.*
Sanna,	*Novi, Kliutch.*

Lakes.—The principal lakes are Scutari, in the N.W. of Albania, drained by the Boyana; Ochrida, between Albania and Macedonia, drained by the Drin; and Janina, in the S.E. of Albania, in the basin of the Arta. There are also several large fresh-water lagoons near the mouth of the Danube, as Rassein, Jalpuch, &c.

Climate.—Owing partly to the elevation of the surface, and partly to its exposure to N.E. winds from the interior of Russia, the climate of Turkey is more severe than its latitude would lead us to expect; and it is, moreover, subject to sudden and violent fluctuations.

Though few of the mountains reach the limit of perennial congelation, snow lies during the greater part of the year in the recesses of the higher elevations; while in the plains of Rumania, the thermometer descends sometimes to 15° below zero, and the sledge is used for travelling, as in Russia. A great portion of Albania, being protected by mountains from N.E. winds, enjoys a delicious climate; but this region is liable to be

visited by destructive earthquakes. In the rocky districts of the interior, and in the maritime valleys of the W., the summer is excessively hot. Around the capital the climate is extremely variable, especially in winter and spring—snow and hard frost alternating with mild weather, and the temperature sometimes changing to the extent of 30° in a single night. At the mouth of the Danube the winter temperature is the same as in the interior of Iceland. The isotherm for January, which passes through the centre of that island and the S.W. of Norway, through Holland and Frankfürt-on-the-Main, crosses the Danube at Regensburg in Bavaria, and the Theiss at Szegedin in Hungary, proceeds along the northern frontier of Wallachia, and quits the continent at Lake Rassein in Bulgaria. At Constantinople the mean temperature for the year is 56°.3, for winter 40°, and for summer 72°. The annual quantity of rain is moderate over the entire peninsula, rarely exceeding 32 inches.

Geology.—The geology of Turkey has not been very accurately explored; but, so far as presently known, crystalline rocks cover almost the entire area bounded by the Balkans, Mount Pindus, and the basin of the Maritza, together with a somewhat extensive tract S. of the Gulf of Burgas. Silurian strata do not occur, but N.W. of Constantinople there is a small tract of upper palæozoic; another in the Balkan Mountains; and a third on the Danube, near Orsova. Secondary strata chiefly occupy the western provinces, together with a long belt N. of the Balkans, extending from the Morava to the Black Sea. Rumania, and the N. part of Servia and Bosnia, all lying in the basin of the Save and Lower Danube, belong to the tertiary series; as also the S.W. of Albania, from the Scombi to the G. of Arta, together with the basin of the Maritza.

Minerals.—Coal is nowhere found, except a small quantity in the mountains of Rumelia. Iron of the best quality is very abundant, but the mines in actual operation are few in number. Many of the veins which traverse the crystalline schists are highly metalliferous, and lead yielding a considerable percentage of silver has at different periods been wrought to some extent; but neither government nor people seem inclined to turn the mineral treasures of the country to good account. Other minerals are, gold in small quantities, copper, magnetic iron, marble, sulphur, salt, and alum.

Botany and Agriculture.—Turkey belongs entirely to Schouw's *third* phyto-geographic region, and its flora, therefore, corresponds to that of the other two great peninsulas of Southern Europe (see p. 82). A great difference, however, exists between the vegetation of the basin of the Danube and that of the provinces S. of the Balkans. In the former the forests consist of the pine, beech, oak (which yields the Valonia acorn, so valuable for tanning), lime, and ash, besides the apple, pear, cherry, and apricot, which cover the whole surface throughout extensive districts; whereas in the latter these trees are confined to the sides of the mountains, while the lower grounds exhibit the plane, maple, carob, almond, sycamore, walnut, and chestnut trees, as also the box, myrtle, laurel, and numerous evergreens. Large forests of fir and pine occur in Bosnia.

The olive thrives in the maritime plains of Albania, where also the

orange and citron are cultivated; and the vine in all the provinces, though in the valley of the Danube the fruit is deficient in saccharine matter. Little wine is produced for exportation, as it is so carelessly manufactured as to be unfit for shipping. While Candia and Cyprus were possessed by the Venetians, they supplied all Europe with the choicest dessert wines. Now, however, the total produce of the vintage of these islands does not amount to one-tenth of what it then was. Fruit-trees of numerous species are extremely abundant, especially in Albania; while the southern base of the Balkans, especially the plain of Adrianople, is remarkable for the abundance of its roses, from which the celebrated *attar* (otto of roses) is distilled. About 300,000 roses are required to produce an ounce of the oil, which, when pure, fetches an enormous price. The opium and other drugs for which Turkey is so famous, are confined to the Asiatic provinces. The system of agriculture pursued is of the rudest description, and only a small portion of the country (probably not more than a sixth) is under cultivation, though the soil is in most parts abundantly fertile, and better adapted for the growth of the cereals than any other part of Europe. Maize is cultivated in the S.; rice, cotton, rye, and barley in the central parts; wheat, barley, and millet in Moldavia.

Zoology.—The fauna of the Hellenic peninsula does not differ very materially from that of the Italian. It comprises 65 Mammals, 42 of which are carnivora, 14 rodentia, 8 ruminantia, and 1 pachyderm —viz., the wild-boar. The carnivora include the bat, bear, badger, marten, wolf, dog, fox, civet, and wild-cat. The rodents embrace the squirrel, beaver, hedgehog, vole, mouse, rat, and hare. The ruminants include the deer, antelope, chamois, and wild-ox. The lion, anciently found on Mount Olympus, has long been extirpated. Birds comprise 259 species, of which 31 are birds of prey, 15 climbers, 100 songsters, 12 gallinaceous birds, 64 waders, and 37 swimmers. The bustard and partridge abound in the valleys, and game is plentiful in the mountains. The Reptiles are 27 in number, embracing land-tortoises, lizards, frogs, and serpents. The Fishes of the Mediterranean, so far as presently known, are 444 in number, and nearly all occur on the W. and S. coasts. Tunny, coral, and sponge fisheries are characteristics of the Mediterranean. Trout and other fish are plentiful in the rivers; and leeches, which abound in the marshes, form an important article of exportation. The fishes and other inhabitants of the Black Sea are regarded as a colony from the Mediterranean, and though fewer in number, do not greatly differ in species.

Ethnography.—The population of European Turkey belongs, for the most part, to three distinct races—the Sclavonian, Greco-Latin, and Turkish.

The Sclavonians, who are by far the most numerous, people Bulgaria, Servia, Bosnia, Herzegovina, Montenegro, and Thessaly. The Greco-Latins occupy Wallachia, Moldavia, and the greater part of Albania, and also embrace about a million of Greeks proper in Rumelia and Thessaly. The large province of Rumelia, especially the part of it extending from the Vardar to the Black Sea, is chiefly inhabited by the Turks or Osmanlee, so named from Osman, the ancestor of the present ruling dynasty and founder of the Turkish Empire (A.D. 1298). The Osmanlee, who

are also called Ottomans, are of Asiatic origin, and are distinguished from other nations by their language, customs, and physical character. Though the dominant race in European Turkey, they are numerically a mere fraction of the population, probably not exceeding 1,500,000 persons. Besides the capital and the eastern part of Rumelia, they form a considerable fraction of the population of most of the large towns. The Turkish language, a rich and polished tongue, forms an important member of the great Finno-Tartarian family (see under "Asia"). The principal Sclavonic dialects spoken in Turkey are the Bulgarian, Servian, Bosnian, and Croatian; while the chief Greco-Latin tongues are the Romaic or Modern Greek, the Wallachian, which is little else than a corrupted Latin, and the Albanian or Arnaute, the probable representative of the ancient Illyrian. The Sclavonians and Greco-Latins, numbering together about 10,000,000, belong to the Greek Church; the Osmanlee, together with a large portion of the inhabitants of Albania, amounting in the aggregate to upwards of 4,000,000, are Mohammedans; while the remainder of the population are Roman Catholics, Armenians, Protestants, Jews, and Gypsies. Formerly the punishment of death was inflicted on any one renouncing the religion of the Korán; and though by a recent decree of the emperor all persecution on religious grounds is abolished, the bigotry of the Mohammedans remains unmitigated. Since the Crimean war, however, Scriptural truth has made considerable progress. The great mass of the people are almost wholly uninstructed; for though elementary schools are somewhat numerous, the knowledge communicated in them is of the most meagre description.

Literature.—The literature of the Turks is of ancient origin and highly respectable. During the reign of Othman and his immediate successors—that is, in the thirteenth and fourteenth centuries—it consisted for the most part of translations from the Arabic, Persian, Greek, and Latin, and more recently from the English, French, and German. These translations embraced works on history, geography, medicine, chemistry, mathematics, and military science. But their original or native literature is of a higher order than is usually supposed.

Ashik Pasha, the oldest Turkish poet of renown, lived during the reign of Osman. The reign of Bayazid II. was distinguished by the poets Nejati, considered the first lyric poet of his time; Mesihi, whose "Ode to Spring" is highly celebrated; and Baki (A.D. 1600), generally regarded as the greatest Turkish poet. The last century produced Nabi Efendi, Seyed Refet, and Raghib Pasha, called "the Sultan of the poets of Rum." Historians are very numerous, and some of them highly esteemed for their impartiality and the concise beauty of their style; as Ali, a contemporary of Baki, whose work, entitled 'Mines of History,' is one of the best sources concerning the earlier and middle periods of Turkish history. Other distinguished historians are Solak Zâde, Haji Khalfah, Edris, Naïma, Rashid, 'Asim Subhi, and Wassif (A.D. 1500–1774). The most distinguished in Biography is Latifi, who wrote the lives of about 200 Turkish poets. Turkish literature has also been enriched by numerous works on morals, divinity, and philosophy. Their philosophy, which originated from the famous school of Bokhàra, has a mystical character, and resembles in many points the speculative doctrines of Schelling, especially with regard to pantheism.—Penny Cyclop., vol. xxv.

Government and Finance.—The government is an hereditary ab-

solutism, the Sultan or Emperor being assisted by thirteen ministers, at the head of whom is the Grand Vizier.

On his accession to the throne, the Sultan, instead of being crowned like other European sovereigns, is girt with the sword of Osman, and made to swear that he will govern the empire in strict accordance with the principles of the Korán. The government of the provinces is administered by pashas, who are absolute in their respective territories, but hold office only during the pleasure of the Sultan. Persons of the meanest origin and basest character are frequently elevated to the office of pasha: hence many of the provinces, especially in Asia, are reduced to deserts, from the rapacity and extortion of their rulers. Corruption, indeed, pervades every department of the state, whether civil, military, or ecclesiastical, and the entire empire threatens to fall speedily to pieces—a consummation which had long ere now been realised, except for the intervention of other European powers. The two principalities of Wallachia and Moldavia were united, in 1861, by a firman of the Sultan, and named Rumania. The reigning prince, who is styled Hospodar, is Charles I., of the House of Hohenzollern-Sigmaringen. The government is hereditary, and constitutional. The Sultan receives from Rumania an annual tribute of £40,000. Servia was ruled by native princes from 1815 to 1856, when it was placed under the protection of the great European powers, as a semi-independent state. The government is vested in the Prince, assisted by a council of five ministers, who are responsible to the nation, but who must be nominally recognised by the Sultan. In Montenegro the ruling prince is styled Hospodar, whose authority is permitted, but not recognised, by the Porte. The military force of Turkey, on the peace footing, numbers 460,000 men, including 75,000 auxiliaries from the three tributary provinces. Previous to the late war with Russia, the navy comprised 70 vessels, carrying 4000 guns. Most of these ships were destroyed by the Russians in 1853, and others foundered in the Black Sea. During the last ten years the navy has been entirely remodelled, and now embraces 185 ships of war (several of them ironclads, built in England), carrying 2370 guns. In 1866, the *Revenue* amounted to £14,589,865; the *Expenditure*, to £14,425,525; and the *Public Debt*, to £69,142,270.

Manufactures and Commerce.—Manufacturing industry is, for the most part, confined to the production of coarse articles for home consumption, as woollen and cotton stuffs, shawls, leather, firearms, together with dyeing and printing works. In the capital, however, and some of the chief provincial towns, silks, fine cottons, embroidery, filigree ornaments, and meerschaum pipes, are extensively produced. In 1864, the total value of the exports and imports amounted to £46,000,000. The former chiefly comprise grain, wool, raw cotton, silk, tobacco, attar of roses, and hides. In 1868, Turkey exported to Britain goods to the value of £4,136,993, the main articles being corn and raw cotton (about £1,000,000 each); receiving in return goods to the value of £5,866,342, two-thirds of which consisted of cotton cloth and yarn. She exports silks in great quantities to Marseilles, hides to Trieste, and attar of roses to various European countries. The principal articles imported, besides the above, are metallic goods and colonial produce. Constantinople is the chief seat of the foreign trade, which, together with the internal traffic, is mainly conducted by Greeks, Armenians, and English. In 1868,

there entered and cleared the Golden Horn 2297 vessels, with 950,000 tons burden.

Internal Communication.—Very few of the *roads* are practicable for carriages, and horses or mules are generally employed for the conveyance of passengers and goods. On the most frequented lines of road are placed caravanserai or *khans*, which are large buildings with an open courtyard in the centre, for the accommodation of travellers. The Danube is the great highway of commerce for the northern provinces, especially since its several mouths came to be embraced within the boundary of Turkey. The navigation of its lower course is under the control of a European commission, appointed in 1856, which holds its sittings at Galacz. There are no *canals*, and only two lines of *railway*—viz., from Varna to Rustchuk, and from Kustendji to Tchernovoda—total, in 1868, 180 miles.

RUSSIA.

THE Russian Empire is the largest state in the world, with the exception of the British, which considerably exceeds it. In addition to its European territories, which occupy more than a half of the continent, it embraces one-third of the vast continent of Asia. It is 4830 miles long from E. to W., along the Arctic circle, has an average breadth of about 1750 miles, and an area of nearly 8,000,000 sq. m.—being upwards of one-seventh of the land-surface of the globe. Its population is remarkably small in proportion to its prodigious extent, being only 78,388,000 persons, or one-fifteenth the population of the globe. The British Empire, with an area of 8,727,651 sq. m., has 243,327,065 inhabitants; the Chinese Empire, with an area of 4,693,000 sq. m., has 477,500,000 inhabitants; and the United States of America, with an area of 3,591,849 sq. m., has a population of 38,422,995. The following table presents at one view the area and population of the different sections of this vast empire:—

	Area in English Square Miles.	Population in 1864.
Russia in Europe (including Finland and Poland,	2,110,317	68,381,742
Transcaucasia,	170,798	4,506,531
Siberia and Central Asia,	5,585,979	5,500,000
Total,	7,867,094	78,388,273

RUSSIA IN EUROPE.

Position and Boundaries.—N., the Arctic Ocean and Norway; W., Sweden, the Baltic, Prussia, Austria, and Moldavia; S., the Black Sea and Mount Caucasus; E., the Caspian and Siberia, from which it is separated by the Ural river and mountains. Two governments (Perm and Orenburg) extend beyond the proper limits of Europe; but these, together with Transcaucasia, we shall here regard as belonging to European Russia. The strictly European portion of the empire lies between lats. 40° 20′ and 70° N., and between lons. 17° 50′ and 67° E., and so embraces nearly 30° of latitude, and 49° of longitude.

Moscow, the former capital (lat. 55° 42′, lon. 37° 39′), is situated almost exactly in the centre, and is on the same parallel as Nain in Labrador, Edinburgh, Copenhagen, Tomsk, and the middle of the peninsula of Kamtschatka; and on the same meridian as Onega, Kertch, Aleppo, Damascus, Medina, Gondar, and Quillimanè; but St Petersburg, the modern capital, is in the same latitude as C. Farewell, Lerwick, and Christiania. If Poland be omitted, the form of European Russia is a tolerably regular oblong, having its greatest length, from N. to S., about 2000 miles. The extreme breadth, in the latitude of Warsaw, is 1500 miles. The coast-line is about 4700 miles, being 1 mile of coast to every 448 m. of surface. This seaboard belongs to four distinct seas—viz., the Arctic Ocean, 2000 miles; the Baltic, 1000; the Black Sea and Sea of Azov, 1000; and the European coast of the Caspian, 700 miles. The northern seaboard, however, is comparatively useless, being frozen for nine months in the year; but the deficiency is compensated for by the numerous canals and navigable rivers with which Russia is intersected in all directions.

Area and Population.—Area 2,110,317 sq. m.; or, including Transcaucasia, 2,281,115. This area is only a little more than the fourth part of the entire empire, and yet it is seventeen times that of the British Isles, or about three-fifths of the entire area of Europe. In 1864 the population of European Russia was 68,381,742; or, including Transcaucasia, 72,388,273, being about 32 persons to the sq. mile. In 1725 the population of the entire empire was only 14,000,000; at the accession to the throne of the Emperor Nicholas, in 1825, it amounted to 51,000,000; while it is now nearly 80,000,000. This single fact most vividly represents the aggressive policy of Russia.

Political Divisions.—European Russia, including the region beyond the Caucasus, is divided into 68 distinct governments and 3 territories. These are usually grouped into 10 main sections, which, though no longer regarded as political designations, are so familiar to the Russians themselves, and are so frequently mentioned in the geographical, historical, and statistical details of the present day, that an acquaintance with them is of great importance. The geographical position of these divisions is as follows:—

1. The Baltic Provinces, containing the capital, in the extreme W. of

the empire, bet. the Baltic Sea and the Gulf of Finland. 2. The Principality of Finland, in the N.W., and chiefly bet. the Gulfs of Finland and Bothnia. 3. Muscovy, or Great Russia, in the N., N.E., and centre. 4. Czarate of Kasan, bet. Muscovy and Siberia. 5. Czarate of Astrakhan, bet. Kasan and the river Ural. 6. Russian Poland, in the S.W., bet. Austrian and Prussian Poland. 7. West Russia, S. of the Baltic Provinces, and bet. Poland and Muscovy. 8. The Ukraine, or Little Russia, S. of Great Russia. 9. South Russia, bet. Little Russia and the Black Sea. 10. Caucasia, bet. the Black Sea and the Caspian. Muscovy formed the original nucleus of the empire; it was freed from the Tartar yoke by Ivan Basilowitz, the first Czar, in 1479; the kingdom of Kasan was conquered from the descendants of Zenghiz Khan in 1552; Astrakhan, formerly a Tartar kingdom, was annexed to Russia in 1557; the Ukraine, long a cause of strife between the Muscovites, Lithuanians, and Mongols, came into the possession of the Czars in 1686; the Baltic Provinces were seized from Sweden between 1700 and 1710, and Finland in 1809; South Russia was ceded by Turkey, partly at the Peace of Jassy in 1792, and partly at the Peace of Bucharest in 1812; the region of the Caucasus was wrested from Persia between 1723 and 1813; Russian Poland was annexed at the three successive partitions of that ill-fated kingdom, in 1772, 1793, and 1795; while Circassia has been subjugated during the last few years.

The Baltic Provinces.

St Petersburg or Ingria.—St Petersburg 540, Kronstadt 48 n. (Neva), Zarskoï-Selo 11 n. (Ischora).

Towns between 5000 *and* 10,000 *inhabitants.*—Gatshina, Narva.

Esthonia.—Revel 29 (G. of Finland).

Livonia.—Riga 102 (Düna), Dorpat 14 (Embach), Pernau 7 (Pernau).

Courland.—Mittau 23 (Treider-Aa), Libau 9 (W. coast).

Principality of Finland.

Finland.—Helsingfors 23, Abo 17 (G. of Finland).
Viborg, Uleaborg, Biörneborg, Wasa, St Michel.

Muscovy or Great Russia.

Arkhangel.*—Arkhangel 21 (Dwina).

* The Russian alphabet now in use consists of 36 letters, 12 of which are vowels, 3 semi-vowels, and 21 consonants. Not a few of the sounds thus represented are peculiar to the Sclavonic languages, and cannot be adequately represented by the Roman or German alphabets. Hence the attempts made to render them into the other European tongues have not been altogether successful, and not a little discrepancy has arisen between the various orthographies employed—so much so, indeed, as to render any attempt at rules for pronouncing Russian next to useless. Those we give refer exclusively to the dialect of Great Russia. The vowels are very differently pronounced, according as they have or have not the tonic accent. In this respect it greatly resembles the English.

e initial = *a* in *make*, as Ekaterinburg (*Ai-kat'er-in-burg*).

ez, either the same as *ts* in *mats*, or as *ch* in *church*, as Czar, Toropecz (*Tsar* or *Tshar*, *Tor-o-pets'* or *Tor-o-petsh'*).

j initial = *y* in *yonder*, as Jaroslav (*Yar-o-slav'*).

j, medial or final = French *j*, or *s* in *pleasure*, as Nijni-Novgorod (*Nizh'ni-Nov-go-rod'*).

w = *v* in English, as Wolga, Twertza (*Vol'ga*, *Tvert'za*).

Olonets.—PETROZAVODSK 11 (Lake Onega), Olonetz 3 (Lake Ladoga).

Vologda.—VOLOGDA 19, Ustiug-Veliki 13 (Sukhona).

Novgorod.—NOVGOROD 18 (Volkhov), Borovitchi 12 (Msta).
Staraja-Russa, Tikhvin.

Jaroslav.—JAROSLAV 28, Uglitch 11, Rybinsk 15 (Volga).
Rostov.

Kostroma.—KOSTROMA 14 (Volga).

Pskov.—PSKOV 17 (Velikaja), Toropecz 6 (Toropa).

Tver.—TVER 29, Rshev 19, Ostashkov 10 (Volga), Torshok 16 (Tvertsa), Vishneĭ-Volotchok 14 (Tsna).

Vladimir.—VLADIMIR 13 (Kliazma).
Alexandrov, Pereslav, Murom, Melenki, Vixa.

Nijni-Novgorod.—NIJNI-NOVGOROD 42 (Volga), Arzamas 12 (Tiosha).
Potshinki, Murashkino, Pavlovo.

Smolensk.—SMOLENSK 23 (Dnieper), Viasma 13 (Viasma).
Dorogobusk, Roslavl.

Kaluga.—KALUGA 35 (Oka), Shisdra 10 (Shisdra), Borovsk 5 (Protva).

Tula.—TULA 57 (Upa), Bielev 7 (Oka), Jefremov 7 (Metscha).

Riazan.—RIAZAN 22, Kasimov 11 (Oka), Skopin 13 (Werda).
Pronsk, Mikhaïlov.

Moscow.—MOSCOW 362 (Moskva), Kolomna 16, Serpuchov 11 (Oka).
Borodino, Troitskoi-Monastere.

Orel.—OREL 35, Mzensk 14 (Oka), Jeletz 27, Livny 14 (Sosna-Bistraïa).
Katchev, Briansk, Sievsk, Bolkhov.

Kursk.—KURSK 29, Putivl 7 (Seim), Bielgorod 15 (Donetz), Staroï-Oskol 11 (Oskol).
Korotcha, Rylsk, Miropolie, Oboian, Novoï-Oskol.

Voronetz.—VORONETZ 41 (Vorona).
Birioutche, Javrov.

Tambov.—TAMBOV 36, Morshansk 16 (Tzna), Lipetsk 13, Kozlov 29 (Vorona).
Jelatom, Usman, Shatsk.

CZARATE OF KASAN.

Perm.—PERM 19, Kungour 12 (Kama), Ekaterinburg 22 (Isset), Nijni-Taglisk 27 (Tagil), Neviansk 18 (Neiva).
Irbit, Kushvinsk.

Viatka.—VIATKA 15 (Viatka).

Kasan.—KASAN 63 n. (Volga), Tchistopol 10 (Kama).

Simbirsk.—SIMBIRSK 25, Syzran 21 (Volga).

Penza.—PENZA 27 (Sura), Saransk 13 (Saranga, *aff.* Alatyr).
Krasno-Slobodsk, Nijni-Lomov.

CZARATE OF ASTRAKHAN.

Saratov.—SARATOV 63, Wolgsk 24, Dobovka 12, Khvalinsk 11 (Volga), Kusnetz 13 (Sura).
Kamyschin, Petrovsk.

Samara.—SAMARA 34 (Volga).

Orenburg.—ORENBURG 28, Uralsk 11 (Ural).
Troitsk, Tcheliabiansk.

Astrakhan.—ASTRAKHAN 43 (Volga).

Ufa.—UFA 16 (Ufa).

KINGDOM OF POLAND.

Warsaw.—WARSAW 244 (Vistula), Lodz 34 n. (Bzura), Czentochov 13 (Wartha), Kalisch 14 (Prosna).

Radom.—RADOM 9 (Radomka).

Lublin.—LUBLIN 22 (Bistritza).

Plock.—PLOCK 17, Praga 8 (Vistula)

Augustowo.—SUWALKI 17 (Szezupa).
Wladislawaw, Kalwary, Augustowo.

WEST RUSSIA.

Kovno.—KOVNO 24 (Niemen), Rossieny 12 (Dubisa), Shavli 16 (Kovno).

Vilna.— VILNA 69 (Vilia).

Vitebsk.—VITEBSK 28, Polotsk 12, Dünaburg 28 (Düna).

Grodno.—GRODNO 26 (Niemen), Slonim 11 (Shtshara), Brzesc-Litovski 21 (Bug), Bialystock 17 (Bialy).

Minsk.—MINSK 30 n., Bobruisk 19 (Berezina), Pinsk 11 (Pina).

Mohilev.—MOHILEV 48 (Dnieper), Gomel 13 (Soj).

Volhynia.—JITOMIR 35 (Teterev), Staro-Konstantinov 12 (Slutch), Kremenetz 10 (Irva).
Lutsk, Vladimir.

Podolia.—KAMINIETZ 21 n., Mohilev 10 (Dniester), Balta 15 (Kodyma), Vinnitza 11 (Bug).

THE UKRAINE OR LITTLE RUSSIA.

Tchernigov.—TCHERNIGOV 11 (Desna), Nejin 18 (Oster), Glutchov 11 (Kleven), Starodub 11 (Babintza).
Berezna, Sosnitza.

Kiev.—KIEV 68, Tcherkasi 20 (Dnieper), Vasilikhov 12 (Stugma), Berditchev 53 n. (Teterev), Svenigorodka 11, Uman 14 n. (Smiuka).

Poltava.—POLTAVA 31 (Vorskla), Krementschug 23 (Dnieper), Perejaslav 10 (Trubesh), Priluki 11 (Sula).
Kobyliaki, Mirgorod.

Kharkov.—KHARKOV 52 (Kharkova), Starobielsk 13 n., Isium 11 (Donetz), Akhtyrka 15 (Vorskla), Lebedin 14, Sumy 13 (Psiol, *affl.* Dnieper), Bielopol 12 n. (Seim).

SOUTH RUSSIA.

Bessarabia.—KISHENAU 94 (Buik *affl.* Dniester), Akerman 29, Bender 22, Chotyn 19 (Dniester).

Kherson.—KHERSON 40 (Dnieper), Odessa 119 (S. coast), Nicolaïev 65 (Bug), Bobrinetz 10, Elizabetgrad 25 (Ingul).

Taurida.—SIMFEROPOL 17 (Salghir), Karasu-bazar 16 (Karask), Bakchi-Seraï 11 n. (Alma), Sebastopol 8 (Tchernaya), Berdiansk 12 (Sea of Azov), Kertch 21 (Str. of Yenikaleh).
Balaklava, Kaffa, *Inkermann*.

Ekaterinoslav.—EKATERINOSLAV 20 (Dnieper), Taganrog 24 (Sea of Azov), Rostov 29, Nakhitchevan 11 (Don), Novomoskovsk 10 (Samara).

Don Cossacks.—NOVO-TCHERKASK 17 n. (Don).

CAUCASIA (Ciscaucasia and Transcaucasia).

Stavropol.—STAVROPOL 17 (Jachla), Kizliar 12, Mozdok 11 (Terek). Ekaterinograd, Georgievsk.

Ter. of the Kuban.—JEISK 17 (G. of Taganrog), Ekaterinodar 10 (Kuban).

Ter. of the Terek.—VLADI-KAUKAS 4 (Terek).

Tiflis.—TIFLIS 61, Elizabetpol 15, Akhalzikh 15 (Kur).

Erivan.—ERIVAN 12 (Zenghi), Alexandropol 15 n. (Arpar).

Shemakha.—BAKU 13 (Caspian), Nukha 21 (Kur), Shusha 20 n. (Aras).

Ter. of Daghestan.—DERBEND 11 (Caspian), Kuba 11 (Kuba).

Kutais.—KUTAIS 4, Poti (Rion).

Descriptive Notes.—Including the provinces of Transcaucasia, European Russia contained, at the last census, five towns of upwards of 100,000 inhabitants (St Petersburg, Moscow, Warsaw, Odessa, Riga); ten bet. 100,000 and 50,000 (Kishenev, Saratov, Vilna, Kiev, Nicolaïev, Kasan, Tiflis, Tula, Berditchev, Kharkov); fifty-one bet. 50,000 and 20,000; and ninety bet. 20,000 and 10,000.

St Petersburg, the capital of European Russia and of the whole Russian empire, situated on both sides of the Neva, and on several small islands formed by the river, was founded by Peter the Great in 1703. It is chiefly built of wood, but the palaces and public buildings are massive stone erections. Its commerce is extensive with all parts of the world: the annual imports are valued at £3,000,000, and the exports at £2,000,000; and there is regular steam-communication with all the principal ports of Europe. The low islands of the Neva are strongly fortified, and the city is defended by the impregnable fortress of **Kronstadt**, the principal naval station of the empire. **Zarskoi-Selo**, the Versailles of Russia, contains the summer residence of the Czar. **Revel** or **Reval**, a strongly-fortified seaport town, founded by Valdemar II., King of Denmark, in 1218, was taken from Sweden by Russia in 1710, and was at one time the great emporium of the Hanseatic League for the trade with Novgorod. **Riga**, a large, fortified, and commercial city near the mouth of the Düna, was founded in 1200, and remained long one of the chief Hanseatic towns. It contains several colleges, a public library, and many scientific establishments. It exports largely flax and hemp. **Dorpat** contains a celebrated university, founded by Gustavus Adolphus in 1632. **Mittau**, noted for its gymnasium and literary societies, has manufactures of linen and soap. **Helsingfors**, the capital of Finland since 1819, is the seat of a university which has a library of 80,000 vols.; it has a harbour suited for line-of-battle ships, and defended by the strong citadel of *Sveaborg;* trade in timber, corn, and fish. **Abo**, the former capital of Finland, and the cradle of its Christianity, was at one time a celebrated and flourishing town, but was almost wholly ruined by fire in 1827. **Arkhangel**, the most important city in the north of Russia, was the only seaport in the empire previous to the founding of St Petersburg, after which it began to decline;

but it still remains the emporium of the trade with Siberia and the northern governments. It is strongly fortified, and the seat of a depot of the Russian military marine. **Petrozavodsk** has two spacious docks, an imperial cannon-foundry, powder-mills, and manufactures of silks. **Vologda**, a place of considerable trade, with a large annual fair. **Novgorod**, at one time the capital of an independent state, and a great commercial emporium, has fallen into insignificance since the founding of St Petersburg in 1703. **Jaroslav**, an important manufacturing town on the Volga. **Kostroma** and **Pskov**, celebrated for the manufacture of russia leather. **Tver**, an important fortified town on the Volga, and on a canal which establishes a connection between the Baltic and Caspian, possesses an extensive trade. **Vladimir**, the capital of the Grand-Duchy of Russia from 1157 to 1328, has a trade in fruit, and manufactures of linen and leather. **Murom** and **Vixa**, with valuable iron-mines, the latter being among the most extensive in Russia. **Nijni-Novgorod**, at the confluence of the Oka and Volga, noted for its great annual fair, the largest in the world, which begins on the 1st of July, and continues for eight weeks, at which time the population amounts to a quarter of a million: merchants from all parts of Europe and Asia attend, and the sales are valued at £22,000,000 sterling. **Smolensk** was a place of great importance as early as the ninth century; was taken by the French army after the famous battle of Smolensk, and a great part of it reduced to ashes. **Viasma**: here the French army was defeated by the Russians in October 1812. **Kaluga**, one of the most important manufacturing towns in the empire, the manufactures consisting of muskets, cloth, oil, paper, cotton, leather, &c. **Tula**, the Birmingham of Russia, and the great seat of its iron manufactures; here vast quantities of arms are made annually, giving employment to 20,000 persons. **Moscow**, formerly the capital of Russia, and still the second city in the empire, greatly surpasses St Petersburg in the extent of its commerce, having water-communication with all the principal cities and ports in the empire. The view of the city from a distance excites the admiration of all travellers: the innumerable towers, some with cupolas, others rising in the form of minarets, and the many gardens and trees intermixed with houses, give it quite an Oriental appearance. Its manufactures of cottons, woollens, silks, and carpets are immense, employing 40,000 weavers. Moscow was founded in the middle of the twelfth century; was sacked by the Moguls in 1233 and 1293; and burned by the Russian general after his defeat by the French army at *Borodino*, Sept. 7, 1812, thus compelling Napoleon to commence his disastrous retreat. **Orel**, the entrepôt for the commerce between N. and S. Russia. **Jeletz** has extensive iron-mines in the vicinity. **Kursk** and **Voronetz** are important manufacturing and commercial towns. **Tambov**, strongly fortified, has a college and a military school for nobles, and an active general trade. **Perm** has a great trade in metallic products, which are wrought extensively in the neighbourhood, and is the principal emporium of the trade between Russia and China. **Ekaterinburg**, on the Asiatic side of the Urals, is the centre of all the great ironworks belonging to the Crown. The inhabitants are largely engaged in mining, and in polishing topazes, amethysts, jaspers, and other precious stones obtained in the Urals. **Viatka** carries on great trade with Astrakhan, Arkhangel, and the capital, and has manufactures of iron machinery. **Kasan**, the great entrepôt of the commerce between Siberia, Bokhara, and European Russia, has been long celebrated for its educational establishments. **Simbirsk** maintains a flourishing trade in corn and fish. **Penza** has manufactures of leather and soap; iron, chalk, sulphur, and vitriol are found in its vicin-

ity. **Saratov**, a large, fortified, commercial and manufacturing city on the Volga. **Samara**, the capital of a government of same name, contains some ironworks, and a trade in cattle, sheep, and fish. **Orenburg**, a fortified city on the Ural, carries on an extensive trade with Bokhara and other parts of Central Asia. **Astrakhan**, at the mouth of the Volga, is a thriving commercial city, with manufactures of cotton, silk, leather, and shagreen: from its favourable situation it has become the entrepôt between Russia, Persia, and India. **Ufa**, cap. of new government of same name, is a walled town with 16,000 inhabitants. **Warsaw**, the capital of Poland since 1566, and the great entrepôt of its commerce, is in point of population the third city in the empire, and contains the largest Jewish population of any city in Europe. Warsaw is strongly fortified, is one of the principal stations of the Russian army, and the scene of unparalleled atrocities on the part of the Russians during the Polish insurrection of 1863. **Kalisch**: near it the Poles defeated the Swedes in 1706. **Lublin** has extensive cloth-manufactures and trade in corn and Hungarian wines: also three large fairs, each lasting a month. **Plock** has manufactures of leather and skins, and an active transit trade. **Kovno** is famous for its mead, has an active trade in corn, and some linen-weaving. **Vilna**, the former capital of Lithuania, is a large town with a considerable trade. **Vitebsk**, built of wood and enclosed by walls, has a college for nobles, and manufactures of woollen cloth and leather. **Grodno**: here Stanislaus, last king of Poland, abdicated his crown in 1795. **Minsk** carries on a large trade in timber, iron, and russia leather, and has manufactures of woollen cloths and hats. **Moghilev** conducts a large export trade in agricultural products. **Jitomir** has a flourishing trade in woollens, silks, linens, salt, and agricultural produce. **Kaminietz**, a fortified town, containing a theological seminary. **Tchernigov**, a very ancient town, containing numerous buildings of antiquarian interest. It was taken by the Tartars in 1239, after an obstinate resistance, and again by the Poles in 1617. **Kiev**, once the capital of Russia, is an ancient and fortified city, with an arsenal and a richly-endowed university. It is noted for its ancient catacombs. **Berditchev** has great commerce, and four annual fairs, at which goods to the value of £600,000 are disposed of annually. **Poltava** or **Pultawa** contains a monument to Peter the Great, who here signally defeated Charles XII. of Sweden, 27th June 1709. **Kharkov** or **Kharkova** has numerous manufactures and extensive trade; its fairs are among the most important in the Ukraine. **Kishenau** has extensive manufactures of woollen cloths. **Akerman**, a fortified town on the Dniester, has large exports of salt, obtained in the adjacent lakes. Here was concluded, in 1826, a famous treaty, exempting the Danubian provinces (Moldavia and Wallachia) from all but a nominal dependence on Turkey. **Bender**, taken and stormed by the Russians in 1770 and 1809: here Charles XII. resided for seven years after the battle of Poltava. **Chotyn**, formerly an important border-fortress of the Turks, and frequently the object of struggles between them and the Russians. **Kherson**, a fortified town, near the mouth of the Dnieper, and a place of great trade: near it is the tomb of Howard the philanthropist, who died here January 20, 1790. **Odessa**, a strongly-fortified seaport city, and the great commercial emporium for the Black Sea and Danube traffic, was founded in 1792. Its trade chiefly consists in the exportation of grain and in importing foreign goods. It has several hundred large grain-magazines, and is now the third commercial city in the empire: exports and imports valued at £5,000,000 annually. It narrowly escaped bombardment in the late war with Russia. **Nicolaïev**, a fortified town at the con-

fluence of the Ingul and Bug, the station of the Russia Black Sea fleet, and, since the destruction of Sebastopol, the principal naval arsenal of Russia in the Black Sea. **Simferopol** is the residence of all the Russian authorities in the Crimea. **Bakchi-Seraï**, near the Alma, a small river, on whose banks the allied army obtained a brilliant victory over the Russians, 20th September 1854. **Sebastopol**, at the mouth of the Inkermann, formerly the Gibraltar of Russia, was founded by the Empress Catharine in 1787, and made the chief naval arsenal for the Russian fleet. Immediately after Turkey declared war against Russia, a large Russian squadron issued from Sebastopol and destroyed the greater portion of the Turkish fleet at Sinope, November 13, 1853, when 4000 Turks perished. To avenge this outrage, and to check the numerous encroachments of Russia, England and France declared war against Russia in the following March. They sent one fleet to the Baltic, which destroyed Bomarsund, &c.; and another, together with a large military force, against Sebastopol. The landing was effected at Old Fort, about thirty miles south of Eupatoria, on the 14th September 1854; and on the 20th September, 25th October, and 5th November following, were fought the memorable battles of the Alma, Balaklava, and Inkermann: on the 8th September, 1855, the Malakoff Tower was taken, and the day following the Russians evacuated Sebastopol, which was reduced to a heap of ruins by the allied army. **Ekaterinoslav**, founded in honour of Catharine II. of Russia, in 1787, has manufactures of cloth, and an important annual wool fair. **Taganrog**, the great outlet for the produce of the countries drained by the Don. **Stavropol**, cap. of government of same name, and of all Ciscaucasia (which consists of one government and two inorganised territories), is a fortified town with some manufactures of soap and leather. **Kizliar**, a fortified town on the Terek, with an active trade in wine. **Jiesk**, capital of the territory of the Kuban, founded in 1848, is a modern seaport town on the Sea of Azov. **Vladi-Kaukas**, a town and fortress at the N. entrance of the Dariel Pass, the principal pass of the central Caucasus. **Tiflis**, formerly the capital of Georgia, and now of Transcaucasia, is well fortified, and is the great mart for the interchange of Russian, Turkish, and Persian produce. **Akhalzikh**, a fortified town taken by the Russians from the Turks, with trade in silk and honey. **Erivan**, formerly capital of the Persian province Azerbijan, situated on the great caravan-route between Tiflis and Erzroum, has a considerable transit trade. It has a strong citadel, taken by the Russians in 1804. **Alexandropol**, a strong fortress at an elevation of 5860 feet, where the cold is often intense. **Baku**, capital of province Shemakha, has the best harbour on the W. side of the Caspian: it exports vast quantities of naphtha and salt from the Apsheron peninsula. Within 10 m. of this town is Atash-ja ("sacred flame"), the place of pilgrimage of the fire-worshippers of Asia. Here the soil is impregnated with sulphur and inflammable gas. **Derbend**, a place of great strength and importance, being situated at the entrance of a defile in the Caucasus, called by the ancients the Albanian Gates.

Capes, Peninsulas, and Islands.—Zelania, N. of Novaia Zemlia; Kanin and Sviatoï, on either side of the entrance to the White Sea; Hango Head, S.W. of Finland; Domesnes, N. of Courland; Kinburn Point, N.W. of Taurida; Chersonese, S. of the Crimea; Apsheron, the E. extremity of Mount Caucasus. The only important PENINSULAS are Shemokhovskaia, bet. the White Sea and the G. of Tcheskaia, and the Crimea, in the S. of Taurida. ISLANDS.—Vaigatch and Novaia Zemlia, N.E. of Arkhangel; Spitzbergen and the Seven

Sisters, 10° N. of Norway; Kolguev, between Vaigatch and Cape Kanin; Solovetskoï group, in the White Sea; Aland group, S.W. of Finland; Kronstadt, near the head of the Gulf of Finland; Dago, Oesel, Worms, Nuko, and Moen, W. of Esthonia.

Seas, Gulfs, and Straits.—Kara Sea, N.E. of Arkhangel; Vaigatch Str., bet. Vaigatch I. and the mainland; Karskaia Str., bet. Vaigatch and Novaia Zemlia; Tcheskaia G. and White Sea, in the N. of Arkhangel; Varanger Fiord, bet. Arkhangel and Finmark; the Baltic, bet. Russia and Sweden; G. of Bothnia, bet. Finland and Sweden; G. of Finland, bet. Finland and Esthonia; G. of Riga, bet. Esthonia and Courland; Black Sea, bet. Russia and Asia Minor; G. of Odessa, S. of Kherson; G. of Perekop, N.W. of the Crimea; Sea of Azov, bet. Taurida and territory of the Kuban; Str. of Kertch, uniting the Black Sea and Sea of Azov; Caspian Sea, separating Russia from Persia and Independent Tartary.

Mountains.—Russia is the least mountainous country in Europe; for though two immense mountain-chains skirt its E. and S.E. frontiers, the latter containing several summits greatly loftier than Mont Blanc, the whole of the interior and west consists of one enormous plain, which extends from the Arctic Ocean to the Black Sea, and from the Baltic to the Caspian, with the single exception of the Valdai Hills, at the sources of the Volga.—(See under "Europe," p. 70.)

THE VALDAI HILLS, in the government of Novgorod, divide the waters flowing into the Baltic from those entering the Caspian. Highest summit, between Ostashkov and Valdai, 1100 feet.

THE URAL RANGE, separating European Russia from Siberia, and the basins of the Petchora and Volga from that of the Obi. Reckoning, as is usually done, from Orenburg to the Arctic Ocean, they traverse 18° of latitude; but as they in reality commence near the Sea of Aral, and have an insular prolongation in Vaigatch and the two islands of Novaia Zemlia, they extend over 30° of latitude, or 2000 English miles. The highest summits are the following:—Konjak-Ofski (lat. 59° 55′), 5397 ft.; Obdorsk (lat. 67°), 5286 ft.; Taganaï (lat. 55° 20′), 3592 ft. The Urals nowhere attain the limit of perpetual congelation, and are usually of very moderate elevation. They are covered with dense forests, and are rich in gold, precious stones, and other valuable minerals. The mountain-passes are not remarkable; the only good carriage-road leads from Perm to Ekaterinburg.

THE CAUCASUS.—This vast chain, the loftiest in Europe, extends from Cape Apsheron, in the Caspian, to the Peninsula of Taman, between the Black Sea and Sea of Azov, being a total distance of 750 miles. They separate Europe from Asia on the S.E., and the basins of the Kuban and Terek from those of the Kur and Rion. Mount Elburz, the culminating-point of Europe, 18,571 ft.; Mount Kazbek (lon. 44° 20′), 16,523 ft.; elevation of line of perennial snow, 11,000 ft. Cultivation of grain extends from 7000 to 8000 ft. The existence of glaciers is uncertain. The range is covered with timber to a great height. The north side is abrupt and precipitous, but the south side descends by a succession of terraces. The Caucasus contain no active volcanoes, but they are frequently visited by earthquakes. They consist mainly of crystalline rocks; while the principal minerals are copper, lead, iron, sulphur, and coal.

The only *Mountain-passes* practicable for carriages are—The Dariel Pass, from Mozdok to Tiflis, by the valley of the Terek, 8000 ft. high; and the Pass of Derbend, on the east coast.

The *Mountains of the Crimea* are a mere prolongation of Mount Caucasus: culminating-point, Tchatir-Dagh, 5000 ft. high.

River-Basins.—The river-system of Russia belongs to 4 distinct river-basins—viz., those inclining to the Arctic Ocean, the Baltic, the Black Sea, and the Caspian. The two former are the least extensive, although possessing the greater number of rivers, the principal of which are the Petchora, Mezen, Dwina, Neva, Düna, and Niemen. The two latter are represented by the Dniester, Dnieper, Don, Kur, Volga, and Ural. These 12 basins comprise $\frac{3}{4}$ of the area of Russia, and 57 out of the 71 capitals, or nearly $\frac{4}{5}$ of the entire number. Three basins (Neva, Dnieper, and Volga) contain 39 capitals, or about $\frac{1}{2}$ of the whole, and drain an area of 822,000 sq. miles, being considerably over $\frac{1}{3}$ of the area of Russia. The basin of the Volga alone is 527,000 sq. miles.—(For the areas of the other basins, see pp. 72-76.)

Table of Rivers and Towns.—In the following table 168 rivers are enumerated, 33 of which are principal rivers, entering the sea immediately, the remainder being their affluents; and the total number of towns exceeding 5000 inhabitants, contained in their basins, is 320.

Basins inclined to the Arctic Ocean.

Rivers.	*Towns.*
Petchora,	*Ussa.*
Mezen,	*Mezen.*
Dwina and Sukhona,	Arkhangel, Ustiug-Veliki; Vologda.
Jug,	Ustiug-Veliki.

Basins inclined to the Baltic.

Kemi (L. Kemi),	*Tornea*, n., *Kemijoki.*
Ulea,	Uleaborg.
G. of Bothnia,	*Gamla-Carleby*, Wasa, *Christinestad*, *Biörneborg*, *Nystad.*
Lapoki,	*Ny-Carleby*, *Tamerfors*, Tavastehuus.
G. of Finland,	Abo, Helsingfors, *Wiborg.*
Neva,	Kronstadt, n., St Petersburg, *Olonetz.*
Ischora, *l*	Zarskoi-Selo, *Gatshina.*
Woxen,	*Kexholm*, St Michels, Kuopio.
Volkhov (L. Ilman),	Novgorod.
Msta,	Borovitchi.
Lovat,	*Staraja-Russa*, n.
Sias, *l*	*Tikhvin*, n.
Svir (L. Onega), *l*	One-Petrozavodsk.
Luga,	*Burg*, *Luga.*
Narova (L. Peipus),	*Narva*, Pskov, n.
Embach, *l*	Dorpat.
Velikaja,	Pskov.
G. of Finland,	Revel, *Hapsal*, *Arensburg*, n.
Pernau,	*Pernau.*
Boulder Aa,	Riga, n.
Düna,	Riga, Dünaburg, Polotak, Vitebsk.
Treider Aa, *l*	Riga, Mittau.
Disna, *l*	*Vidzy.*
Toropa,	Toropecz.
Vindau,	*Goldingen.*
W. Co. Courland,	Libau.
Niemen,	Memel, Tilsit, Kovno, Grodno.
Szesupa, *l*	*Wladislawow*, *Kalwary*, Suwalki.
Dubissa,	Rossieny.
Niewieza,	*Keidawn.*
Vilia,	Vilna.
Shtshara, *l*	Slonim.

N.B.—For the Pregel, Vistula, &c., see under "Austria."

Basins inclined to the Black Sea.

Rivers.	*Towns.*
Dniester, ...	Akerman, Bender, Mohilev, KAMINIETZ, n., Chotyn, Sambor.
Buik, ...	KISHENAU.
Sered, *l*.....	Tarnopol.
Zelota, *l*....	*Brzezany.*
Bistrica, ...	Stanislawaw.
Tiasmanicka,	Drohobicz.
Co. of Kherson,	Odessa.
Bug, ...	Nicolaiev, Vinnitza.
Ingul, *l*.....	Bobrinetz, Elizabetgrad.
Smiuka, *l*...	Svenigorodka, Uman, n.
Kodyma, ...	Balta.
Sab, *l*	*Lipovetz.*
Row, ...	*Bar.*
Dnieper, ...	KHERSON, *Alexandrovsk*, EKATERINOSLAV, Krementschug, Tcherkassi, KIEV, MOHILEV, SMOLENSK, *Dorogobusk.*
Samara, *l* ...	Novomoskovsk, *Pavlograd*, n.
Vorskla, *l* ..	*Kobyliaki*, POLTAVA, Akhtyrka.
Psiol, *l*	Lebedin, Sumy, *Miropolié*, Obaian.
Khorol, ...	*Khorol, Mirgorod.*
Sula, *l*	Priluki.
Trubesh, *l*..	Perejaslav.
Stugma, ...	Vasilikhov.
Desna, *l*....	KIEV, TCHERNIGOV, *Berezna*, n., *Sosnitza, Briansk.*
Oster, *l*..	Nejin.
Seim, *l*....	Bielopol, n., *Rylsk*, KURSK
Kleven,	Glutchov, n.
Sudost, ...	*Pogar.*
Babintza,	Starodub.
Nerussa, *l*	*Trubtchevsk, Dmitrovsk.*
Sieva, *l*	*Sievsk.*
Sueja, *l*...	*Briansk, Karatchev.*
Teterev, ...	JITOMIR, Berditchev, n.
Pripet, ...	*Mozyr*, Pinsk, n.

Rivers.	*Towns.*
Slutch, ...	Staro-Konstantinov.
Styr, ...	*Lutsk*, Brody.
Irva, ...	Kremenetz.
Soj, *l*	Gomel, *Tcherikov, Mstislavl.*
Iput, *l*	*Suraj.*
Ostr, *l*	*Roslavl.*
Berezina, ...	Bobruisk, MINSK.
W. Co. Crimea,	Eupatoria.
Alma, ...	Bakchi-Seraï, n.
Tchernaya, ...	Sebastopol, *Inkermann.*
S. Co. Crimea,	*Balaklava, Kafa.*
S. of Yenikaleh,	Kertch.
Salghir, ...	SIMFEROPOL.
Karasik, ...	Karasu-bazar.
Sea of Azov, ..	Berdiansk, *Mariopol*, Taganrog, *Azov.*
Don, ...	*Azov*, Nakhitchevan, Rostov, NOVO-TCHERKASK, n., *Lebedian.*
Manitch, *l*..	Starol-Tcherkask.
Egorlik, *l*	STAVROPOL, n., on the Jachla.
Aksai, ...	Novol-Tcherkask.
Donetz, ...	Starobielsk, n., Isium, *Voltchansk*, Bielgorod.
Bakhmuta,	*Bakhmut.*
Oskol, *l* ..	*Novoï-Oskol*, Staroï-Oskol.
Kharkova,	KHARKHOV.
Uda, ...	*Zolotchev.*
Korotcha,	*Korotcha.*
Medviditsa,	*l Petrovsk.*
Bitiug, *l*....	*Bobrov.*
Vorona, *l*...	VORONETZ, *Usman*, n., Lipetsk, Kozlov
Sosna - Bistrala,	Jeletz, Livny.
Metscha, ...	*Jefremov.*
Kuban, ...	EKATERINODAR.
W. Co. Circassia,	ANAPA, *Pitzundra, Sukum-Kaleh.*
Rion, ...	KUTAIS, *Poti.*

Basins inclined to the Caspian.

Kur, ...	TIFLIS, *Shemaka*, n., Elizabetpol, n., Akhalzikh, n., Nukha, n.
Aras, ...	Shusha, n., ERZROUM, n.
Kara-Su, ..	*Ardabil* (Persia).
Vergush, *l*	Shusha.
Kotur, ...	Khoi (Persia).
Mahou, ...	*Bayazid* (in Turkish Armenia).
Zenghi (L.	ERIVAN.
Erivan), *l*	
Arpar or	Alexandropol, n., Kars.
Kars, *l*	
Alazon, *l* ...	*Telavi.*

W. Co. Caspian,	BAKU, DERBEND, TARKI, n.
Kuba, ...	Kuba, *Kulgat.*
Sulak, ...	*Akhulgo, Kurata.*
Terek, ...	Kizliar, Mozdok, *Dariel.*
Volga, ...	ASTRAKHAN, *Tchernoïyar*, Dubovka, *Kamyschin*, SARATOV, Wolgsk, Khvalinsk, Syzran, SAMARA, SIMBIRSK, KASAN, *Murashkino*, NIJNI-NOVGOROD, KOSTROMA, JAROSLAV, Rybinsk, Uglitch, TVER, *Staritza*, Rshev, Ostashkov.

Basins inclined to the Caspian (continued).

Rivers.	*Towns.*
Samara, *l*.	*Buzuluk.*
Kama, *l*.	Tchistopol, Kungour, n., PERM.
Viatka,	VIATKA.
Ufa, *l*.	Ufa.
Sura,	PENZA, Kusnetz.
Alatyr, *l*.	*Potshinki.*
Saranga,	Saransk.
Oka,	NIJNI-NOVGOROD, *Pavlovo, Murom, Melenki, Jelatom,* KASIMOV, RIAZAN, Kolomna, Serpuchov, KALUGA, *Bielev, Bolkhov,* n., Mzensk, OREL or ORLOV.
Kliazma, *l*	VLADIMIR.
Kutchura, *l*	*Troitskoï-Monastere.*
Tiosha,	Arzamas.
Moksha,	*Krasno-Slobodsk, Nijni-Lomov.*
Tzna, *l*	Morshansk, TAMBOV.
Pronia,	*Pronsk, Mikhaïlov.*
Werda,	Skopin.
Moskva, *l*	Kolomna, Moscow, *Borodino.*
Nara, *l*	Serpuchov.
Protva, *l*.	*Borovsk,* Vereja.
Lusha,	*Maloï-Jaroslavitz.*
Shisdra, *l*	Shisdra.
Viasma, *l*	Viasma.
Upa,	TULA.
Kostroma, *l*	KOSTROMA, *Galitch,* n.
Kotorosth,	JAROSLAV, *Rostov.*
Sheksna (L.	*Bielozersk.*
Bielo),	
Nerl,	*Pereslav.*
Jakhrama,	*Dmitrov.*
Dubna,	*Troitskoï.*
Tvertza, *l*	TVER, Torshok.
Tsna, *l*	Vishnei-Volotchok.
Ural,	Uralsk, ORENBURG, *Orsk.*

Lakes.—Russia abounds in lakes, more especially in the north-western provinces. In general they arrange themselves in clusters around Lake Ladoga, the largest fresh-water lake in Europe (area 7150 sq. m.), and, along with it, discharge their surplus waters into the Gulf of Finland. For a full list of the lakes of Russia and of the rivers that drain them, see p. 76. Of *salt-water Lakes*, the Caspian is by far the largest in the world, having an area of 178,866 sq. m.; and even this is probably but a small part of the area it occupied in remote times, when it probably communicated with the Black Sea, Sea of Aral, and the other salt-water lakes of the central Basin of Continental Streams.

Climate.—The watershed inclining to the Arctic Ocean is much colder than in corresponding latitudes in Scandinavia, the surface of a large portion of it being constantly frozen, notwithstanding the continual presence of the sun for many weeks' duration. Beyond the arctic circle mercury freezes in the month of September. Even at St Petersburg (lat. 59° 58′) the thermometer sinks in January to 22° below zero; while in July it rises to 90°; mean temperature, 38°.7 Fahr. South of lat. 58° the mean temperature varies from 40° to 55°; the winters are much shorter than on the northern slope, but almost equally severe, while the summers are long and hot. Notwithstanding these striking extremes of temperature, the climate of Russia is favourable to health; diseases are not common, and human life very frequently attains to its maximum length. Annual fall of rain at St Petersburg, 16 inches; number of rainy days, 171. In the basin of the Volga the rainfall amounts to only 15 inches.

Geology and Minerals.—The geology of Russia was until recently very uncertain, and the more accurate information now possessed is

mainly due to Sir Roderick Impey Murchison and his coadjutors. For the particulars, however, we must refer to the "Geology of Europe," p. 79.

Minerals are numerous and very valuable, especially in the governments of Perm and Orenburg, on both sides of the Ural Mountains, which are richer in valuable minerals than any other mountain-system in Europe. Numerous mines of gold, platinum, copper, magnetic iron, and salt are wrought, giving employment to a large and flourishing population. In Perm alone 100,000 persons are employed in mining operations. The greatest mineral wealth of the chain is on the eastern side, between lats. 54° and 60°; but the western side furnishes marl, gypsum, limestone, sulphur, and copper. Iron abounds in the southern provinces. Coal is deficient in the Urals, but prevails extensively in southern Poland, and, on the Oka, is found associated with iron. Lignite and brown-coal are found in the Crimea. In 1844 enormous deposits of coal were discovered in the government of Moscow; while the coal-field on the Donetz, 100 miles in length, has long been celebrated. Amber is found in Poland and Lithuania; iron, lead, sulphur, arsenic, nitre, in Finland; salt and alum in many places: diamonds of small size, and other precious stones, in the Urals.

Botany and Agriculture. — Russia is wholly included within Schouw's *first* and *second* phyto-geographic regions, which are, for the most part, separated by the arctic circle. The first, or farthest N., is the home of the arctic alpine flora, described under "Europe," p. 81. The second embraces all the rest of Russia and Central Europe (see p. 82). The botany of Russia has not been fully investigated, and we cannot yet state how many species of plants it embraces. Finland, however, is said to contain about 1000 flowering plants. The most peculiar feature of its botany is found in its immense natural forests, which cover about 2-5ths of its entire surface. These abound chiefly in the central districts, between 52° and 60° lat., and are of most essential value to the inhabitants, affording fuel, shelter from the biting winds, and numerous useful articles, as timber, pitch, tar, turpentine, and potash. The trees which most frequently occur are the pine, Scotch fir, and other coniferous trees. The northern limit of the coniferæ passes through the N. of Lake Imandra in Lapland, Cape Sviatoï, and the confluence of the Petchora and Ussa. The largest forest in Europe extends from the Mezen to the Onega, and covers an area greatly larger than the British Isles. The oak extends as far N. as Abo, Novgorod, Vladimir, Simbirsk, and Orsk; the vine to lat. 47½°; the beech to a line drawn from the mouth of the Vistula, south-eastward to the mouth of the Terek; the olive and orange refuse to grow in any part of European Russia except the Crimea, in the southern valleys of which the vine and mulberry, the olive, fig, pomegranate, and orange, all flourish in the greatest profusion.

Over the whole empire agriculture is in its rudest state; the soil is various, but generally excellent; and greatly more corn is raised than is required for home consumption. The upper basin of the Volga is the most fertile part of Russia; and the governments of Nijni-Novgorod, Penza, Kasan, and Simbirsk may be denominated the granary of the

empire. Here the soil consists of a rich black mould of decayed vegetable matter, and is of surprising fertility. The Ukraine is also very fertile, and exports enormous quantities of wheat. Forests cover a great part of the surface of the Polish and Baltic provinces, but the former produce cattle and great quantities of corn. Kasan is level and fertile, abounding in corn and forests of oak. Southern Russia and Astrakhan consist chiefly of *steppes*, or immense deserts, which are divided by the Don into two regions: the high steppes, lying westward, are characterised by the absence of trees, and by long coarse grass and wild-flowers in spring and early summer, but as the heat increases, they assume the appearance of a sunburnt waste. The low steppes to the E. are much more sterile, having a saline, sandy soil, interspersed with intensely salt lakes. The steppes are inhabited by nomadic tribes, who keep large flocks of camels. The vast region extending from the Arctic Ocean to lat. 64° is a swamp in summer, and is covered with ice for nine months in the year. The grains most generally cultivated are rye and oats, the former being the principal article of food used by the inhabitants. Rye extends to lat. 65°, barley to 67°, oats to 62°, wheat to 60°, millet to 55°, maize to 48°; while rice is cultivated only in Transcaucasia. The northern limit of the cereals is marked by a line passing N. of lakes Enara and Imandra, and S. of the town of Mezen, meeting the Urals in lat. 60°. The extent of land under cultivation bears but a small proportion to the whole area of the country. Hemp and flax are chiefly cultivated on the upper Volga; tobacco in the Ukraine; the vine in the Crimea, Odessa, Caucasia, and the lower basins of the Don and Volga; and rice, silk, cotton, madder, melons, pomegranates, and even the sugar-cane, in Transcaucasia.

Zoology.—No accurate statistics have been furnished of the fauna any more than of the flora of Russia, notwithstanding the solid foundations for both departments of knowledge laid by the illustrious Pallas; but it is interesting to know that the isotherm of 41° Fahr. (which divides Northern from Central Europe, and which passes through Trondhjem, Stockholm, Kaluga, Penza, and Orenburg) has on the N. side of it 31 species of carnivora, 212 birds, 10 reptiles, and 24 cetacea. In the higher latitudes the reindeer is a source of wealth; the dreary regions of Novaia Zemlia are frequented by the great white bear, which seldom passes beyond the limits of perennial snow; the bison is found near the sources of the Narew; in the northern forests there are elks, several species of deer, hares, and wild hogs. The wild animals that are hunted for their skins are very numerous, as bears, gluttons, badgers, wolves, foxes, martens, polecats, weasels, ermines, otters, squirrels, and marmots. In the steppes are found wolves, foxes, wild hogs, wild asses, wild horses, and other cattle. The domestic animals of England are found in most parts of Russia. Horses are very numerous in the central and southern provinces, as also black cattle and sheep of various species; camels and buffaloes in the steppes, and dromedaries in the Crimea. Bees are found wild in the forests, and the silk-worm succeeds in the south.

Ethnography.—The people of European Russia, though broken up into a great number of distinct nations, all belong to two great divisions of the human family—the Caucasian and Mongolian.

The first of these divisions is almost exclusively represented by the Sclavonians, who embrace nearly nine-tenths of the entire population. The principal subdivisions of the Sclavonic race, within the limits of Russia, are the Russians proper, the Poles, the Letts, and the Lithuanians, of which the first mentioned are by far the most numerous and widespread. These occupy the central and most fertile provinces; the Poles are for the most part confined to Poland and West Russia; and the Lithuanians and Letts to the Baltic provinces. The second grand division is represented by the Finns, Samoiedes, Tatars, and Calmucks. Of these the Finns are the most numerous, amounting to upwards of 2,000,000. The Samoiedes are few in number, and are confined to the government of Arkhangel. The Tatars inhabit the country north of the Black Sea and the river Kuban, and are nearly as numerous as the Finns; while the Calmucks are confined to the lower basins of the Don and Volga. In addition to these there are upwards of a million of Jews in European Russia, and about a third as many Germans.

Language.—The languages spoken in European Russia are even more numerous than the races that inhabit it; but, in common with the latter, they are nearly all reducible to two great families—the Indo-European and Finno-Tartarian. The nations of Sclavonic blood speak either the Russian, or one or other of its cognate tongues—the Polish, Lithuanian, and Lettish. The Finno-Tartarian family embraces the Finnish, Samoiede, and Georgian of Mount Caucasus; while the Wallachian, spoken in Bessarabia, is a Greco-Latin tongue.

Religion.—The Sclavonians, and more especially the Russians proper, belong to the Greek branch of the Eastern Church; but the great majority of the Poles are Roman Catholics. A considerable portion of the population of Finland and the Baltic provinces are Protestants of the Lutheran type; the Tatars and Circassians are for the most part Mohammedans: while the Calmucks are generally Buddhists. The emperor is the head of the Greek Church, which in doctrine and rites closely approximates to the Roman Catholic. Though other religions are allowed to be professed, the amount of toleration enjoyed is of the narrowest possible description. Any attempt at propagating opinions at variance with those of the national Church, or of proselytising any of its adherents, is punished with imprisonment, and for the third offence with exile to Siberia; or the convert is condemned to loss of property, and to detention for life in a convent.

Education.—Russia is the worst educated country in Europe, there being only 1 out of every 150 of the population at school, while in Germany the proportion is about 1 in 7. The schools are under the surveillance of the priests, and religious instruction constitutes the basis and sum of all school training. Public establishments for the pursuit of science are numerous, and are liberally endowed by the Government—the most celebrated of them being the "Academy of Sciences" at St Petersburg. There are now only six universities—viz., those of Dorpat, Moscow, Kharkov, Kasan, St Petersburg, Kiev—the universities of Wilna and Warsaw having been suppressed by the Government.

Literature.—The literature of Russia is extremely meagre, and confined within narrow limits. The only branches of science that have been cultivated with success are—their own national history, topographical descriptions of foreign countries (chiefly Asiatic), and philological investigations relative to the Sclavic languages, in which they have displayed great ingenuity and perseverance. Philosophy,

and the different branches of natural science, have, till recently, been much neglected. Classical learning, moreover, finds favour only with a few; but poetry, fable, and works of fiction have been much cultivated, and the Russian is rich in elegant translations from the classical and modern languages. The following are a few of the most distinguished names in Russian literature :—

HISTORY: The venerable Nestor, born 1056, laid, by his 'Annals,' the basis of all Sclavic history. Michael Lomonosof, born 1711, is regarded as the father of Russian literature. Nicholai Karamsin, author of the 'History of the Russian Empire,' extending to the reign of the House of Romanoff, died in 1826; and Ustrailov, author of a 'Life of Peter the Great.' POETRY: Gabriel Dershayin, born 1743, celebrated for his inimitable 'Ode to Deity,' which has been translated into many European and Asiatic tongues. The Chinese Emperor has it printed in letters of gold, on white satin, and hung up in his palace. Alexander Pushkin, usually considered the greatest poet Russia has produced (born 1799). PHILOLOGY: Alexander Vostakoff, the first Sclavic scholar in Europe; Kowalovski, distinguished for his knowledge of the Mongolian languages; Bichoorin, the best Chinese scholar in Russia; Senkowski, the celebrated Orientalist; Schaffarik, author of the famous 'History of the Sclavic Language and Literature;' Merslakoff, the first literary critic in Russia; Dobrovsky, a Hungarian, author of 'Grammar of the Sclavonic Languages;' and the celebrated Pallas, a German by birth, who was not only a distinguished naturalist, and historian of the Mongolian nations, but also a laborious and indefatigable philologist. By command of the Empress Catharine, he undertook a comparative vocabulary of all the languages of the world, two volumes of which were published at St Petersburg, in 1789. They contain 286 words, in 200 languages of Asia and Europe. A third volume, which never appeared, was intended to embrace the languages of Africa and America. THEOLOGICAL LITERATURE: Theophon Prokovitch, usually styled the Russian Chrysostom, died 1756; Platon Levshin, the most productive of the ecclesiastical writers; Anastasius Bratonofski who takes the first place among Russian pulpit orators. PROSE WRITERS AND NOVELISTS: Zagoskin, Gretsch, Bestucheff, Muranieff, Batuschkoff, Sagoschkin, Odojewsky, Bulgarin. POLITICS AND STATISTICS: M. L. de Tegoborski, author of 'Commentaries on the Productive Forces of Russia,' 1856. PHYSICAL SCIENCE: Tenner, Struve, and many others.

Government, Army and Navy, &c.—The government is an absolute hereditary monarchy; all power, both in Church and State, emanates from the emperor, and to his decision all matters of importance must be submitted. He cannot, however, safely disregard the laws, nor the opinions and wishes of the nobility, who have greater political influence in Russia than in any other European country. One half of all the land of the country is in their possession, but they have suffered a heavy loss by the recent emancipation of the serfs on their estates. The emperor is aided in all matters that come under his immediate cognisance by a Privy Council. Subordinate to this there are four great boards of administration—viz., the Imperial Council, the Directing Senate, the Holy Synod, and the Council of Ministers.

Army and Navy.—The military force is very great—probably the

greatest in the world. In 1866, the regular army amounted to 697,137 men and officers, besides an irregular force of 177,000 light cavalry, consisting for the most part of Calmucks and Cossacks. The regular army consists of eight grand divisions—viz., the Guards, the Army of the South, the Army of the West, the Army of Lithuania and Poland, the Corps of the Caucasus, the Finland Corps, the regiments of the military colonies, and the army of reserve. The Navy, in 1868, consisted of 267 steamers and 29 sailing vessels. These were manned by 60,230 men, and carried 3600 guns. This force was divided into two principal fleets—the Baltic Fleet and the Black Sea Fleet. Besides these there were 24 ironclads and a fleet of steam-rams, carrying 149 guns, building at St Petersburg and Nicolaïev. A great number of the ships composing the Black Sea fleet were sunk by the Russians in the harbour of Sebastopol, in 1854, to prevent the Anglo-French fleet from entering. The Baltic fleet, in like manner, protected itself behind the fortifications of Kronstadt. The army is maintained at a comparatively small expense, and both army and navy do not cost more than £15,000,000 annually. The *Public Debt*, which in 1853 amounted to £63,537,000, had in 1869 increased to £203,000,000. In the same year the *Revenue* of the empire amounted to £80,346,000, and the *Expenditure* to £72,606,000.

Commerce and Manufactures.—The commerce of Russia is chiefly internal. No country in the world can so well dispense with a foreign commerce. The empire is a world to itself, and wants almost nothing with which the wider world can supply it. It is the only country that produces train-oil in abundance on one of its coasts, and olive-oil, in scarce less abundance, on another,—that can exchange its native seal-skins and ermine furs for its native silk and cotton,—that makes gin from its barley and rye, brandy from its wine-lees, and rum from its sugar,—that barters its cranberries, gathered on the wastes of Siberia, for its pomegranates reared in the Transcaucasian provinces,—and that, while it mixes up its barley-bread, in one of its districts, with the inner bark of the fir, makes its cakes of unimported rice in another. Its commerce is greatly facilitated by its innumerable navigable rivers, and its vast and excellent system of canals, by means of which its four seas are connected together in many directions, and a complete system of inland navigation established, the centre of which is Moscow. A great portion of the internal trade is transacted at annual fairs, the most remarkable of which are those of Nijni-Novgorod, Berditchev, Kursk, and Lublin in Poland. The foreign trade is conducted by means of caravans, which periodically leave Orenburg for Asia, and Perm for Siberia. The chief seaports are—St Petersburg and Riga on the Baltic, Odessa on the Black Sea, Astrakhan on the Caspian, and Arkhangel on the White Sea.

Manufactures.—Owing to the sparseness of the population, the general deficiency of coal, and other causes, Russia can never become a great manufacturing country; but, since the time of Peter the Great, manufactures have made very considerable progress. Most of the articles used by the peasantry are made in the villages, each of which is usually devoted to a single branch of industry. The principal articles manufactured on a large scale are linen, sail-cloth, cordage (the chief factories for which are Moscow and its vicinity), cotton, woollen, and worsted stuffs in most of the large

towns, and silk-spinning at Moscow, which is renowned for its brocades, and gold and silver embroideries. Hardware, cutlery, and firearms, are extensively manufactured at Nijni-Novgorod, Tula, and other places. But Russia is particularly celebrated for its unrivalled russia and morocco leather, largely used in bookbinding, &c. Russia also holds a distinguished place in the manufacture of articles from malachite (green copper ore) and of ornamental glass; while Astrakhan is famous for its isinglass, shagreen, and caviare.

The *Exports*, in 1866, were valued at £35,000,000 sterling, and the *Imports* at £32,500,000. The chief exports are corn, tallow, hides, hemp, flax, linseed, timber, tar, pitch, potash, russia leather, furs, wool, oil, wax, honey, copper, iron, platina, cordage, and sail-cloth. Great Britain is Russia's best customer, taking three-fourths of her flax and hemp, three-fourths of her tallow, three-fifths of her oleaginous grains, two-fifths of her exported corn, &c. The total value of her exports to the United Kingdom, in 1868, amounted to £20,000,000 (or more than half of the entire amount); while she received from us, in return, goods to the value of £7,206,000, consisting chiefly of cotton stuffs and yarn, machinery and mill-work, hardware, iron, woollens, tea, lead, tin, together with large quantities of coal and salt. The mercantile marine is small, and the foreign trade is principally conducted by other nations. In 1865, there arrived in Russian ports 11,648 vessels; cleared, 11,839, carrying 2,390,000 tons. The principal imports are articles of colonial produce, together with raw silk and cotton, manufactured goods, wine, indigo, cochineal, and madder. Tea is imported by the overland caravan-route from China, and many other articles come in the same way.

Inland Communication.—The *Roads* are in general wretched, with the exception of that from the capital to Moscow, which is said to be the finest in the world. The condition of the roads, however, is of less importance, as they are covered with ice and snow for many months in the year, when sledge-travelling is universal.

The *Canals* are very numerous, and of the highest importance. Among the principal may be mentioned:—1. The *Canal of Vishnei Volotchok*, connecting the Twertza with the Msta, thus uniting the Baltic with the Caspian, which, by this route, is 3200 miles distant, and yet the canal is only 3 miles long. It is free from ice from the middle of April to the end of October, and is frequented by about 2000 vessels annually. Another canal, joining the Neva with the Volga, is the *Canal of Tikhvin*. 2. The *Canal of Kubinsk*, uniting the Caspian with the White Sea. 3. The *Maria Canal*, uniting a small river flowing into Lake Bielo with another flowing into Lake Onega—thus connecting (by the aid of No. 2) the Baltic, Caspian, and White Seas. 4. The *Ladoga Canal*, and the *Sias* and *Svir Canals*, form a navigable chain around the south and south-east sides of Lake Ladoga. This is the most frequented of all the Russian canals: it is said that 25,000 vessels pass through its principal sluice annually. *Railway* communication is very limited, considering the extent of the empire. In 1858, only 715 miles were completed; but in 1869 there were 4400 miles open for traffic. The principal railways already executed are:—The great line from St Petersburg to Moscow, 400 miles, with branches to Nijni-Novgorod, Kozlov, and Orel; and the line from St Petersburg to Warsaw and Cracow, with branches to Riga, Vitebsk, Kovno, and Königsberg; and a line from Odessa to Balta, in Podolia. In 1868 there were 24,840 miles of telegraphic communication.

SWEDEN AND NORWAY (SCANDINAVIA).

Boundaries.—The kingdoms of Sweden and Norway, now united under one sovereign, embrace between them the entire north-western peninsula of Europe, usually called Scandinavia. N., the Arctic Ocean; W., the Atlantic, North Sea, and Kattegat; S., the Skager Rack and the Baltic; E., the Baltic and Finland. Lat. 55° 20′—71° 6′ N.; lon. 4° 50′—31° 5′ E.

Stockholm, the capital of Sweden, on the east coast of the peninsula (lat. 59° 17′, lon. 18° 3′), is nearly on the same parallel of latitude as Lerwick, Christiania, St Petersburg, Tobolsk, Mount St Elias (in N.-west America), and Cape Farewell (in Greenland); and nearly on the same meridian as Spitzbergen, Danzig, Buda, Mostar, Otranto, Gulf of Sidra, and Cape Town. Scandinavia is the largest peninsula in Europe, and, in common with nearly all the others, stretches out in a general southerly direction: extreme length, 1190 miles; greatest breadth, 490 miles. The peninsula is traversed, in the direction of its greatest length, by an immense mountain-range, which, being confined to the side next the ocean, gives Norway a highly Alpine character; while Sweden, or the eastern half, is in general low and level; but, towards the mountains, it rises in a succession of terraces, marked by cataracts in the numerous streams, which generally follow a straight course towards the Baltic, and frequently expand into long narrow lakes. Coasts low and sandy on the eastern side, but deeply indented on the western by rock-bound inlets, called *fiords*, and lined by an innumerable multitude of small islands. Coast-line, without including the inlets, about 3000 miles, or one mile of seaboard to every 98 square miles.

Area and Population.—The area of the entire peninsula is 293,920 sq. m., of which 123,291 belong to Norway, which is very little larger than the British Isles; and 170,629 to Sweden, which is nearly half as large again as Norway. In 1868 the united population amounted to 5,874,836; that of Norway being 1,701,756, or about half the population of Scotland; and that of Sweden 4,173,080, or one-fourth larger than the population of the latter country. Scandinavia is thus the most thinly peopled country in Europe, having only 20 persons to each sq. mile.

Political Divisions.—Sweden is divided into three large *provinces*, or for administrative purposes, into twenty-four *läns*, and Norway into six *stifts* or counties.

Sweden, Three Provinces.

Gothland.*—Gothenburg 43 (Götha), Malmöe 22, Helsingborg 6,

* In Swedish, the vowels *a*, *e*, *i*, *ä*, and *ö* have the same sounds as in German; as in Karlstad, Wener, Indals, Mälar, Jönköping.

a = *o* in stone, as Abo, Lulea (*O'boo*, *Lu'le-o*).
o at the end of a syllable = *oo* in food, as Orebro (*Or'e-broo*); in other cases, like *o* in *not*.
u = *oo* in food, as Umea (*Oo'me-o*).
y = German *ü*, as Nyköping (*Nü'chö-ping*).
g and *j* before a vowel = *y* in you, as Gefle, Jönköping (*Yev'leh*, *Yön'chö-ping*).
ki or *kj* = *ch* in church, as Linköping, Linkjöping, or Linköping (*Lin'chö-ping*).
z = *ts*, as in German. All other consonants are sounded as in English.

Landskrona 7, Lund 9 n. (the Sound), Carlscrona 16, Kalmar 9 (the Baltic), Norrköping 22 (Motala), Jönköping 9 (Lake Wetter), Christianstad 6 (Helge).

Svealand.—STOCKHOLM 129, Westerås 5 (L. Mælar), Orebro 9 (L. Hielmar), Upsala 9, Dannemora (Sala), Fahlun 5 n. (Dal), Nyköping 5 (E. co.)

Norrland.—Hernösand 2 (Angermann), Gefle 12 n. (Dal), Sundsvall 5 (Indals).

NORWAY, SIX STIFTS.

Agershuus.*—CHRISTIANIA 66, Frederickshald 7 (G. of Christiania), Drammen 14 (Drammen), Frederickstadt 3 (Glommen).

Christiansand.—Christiansand 11 (Torrisdals), Stavanger 17 (Bukke Fiord), Mandal 3 (Skager Rack).

Bergen.—Bergen 30 (Kors Fiord).

Trondhjem.—Trondhjem or Drontheim 19 (Trondhjem Fiord), Roraas 4 (Glommen).

Nordland.—Tromsöe 3 (W. coast), Alstahoug 1 (Wessen).

Finmarken.—Hammerfest 1 (Whale Island), Altengaard 2 (Alten).

Descriptive Notes.—There are only fifteen towns in the whole peninsula with more than 10,000 inhabitants, of which only six exceed 20,000—viz., Stockholm, Christiania, Gothenburg, Bergen, Malmöe, and Norrköping; while Stockholm alone exceeds 100,000.

SWEDEN.—**Gothenburg,** the second city in Sweden both as regards population and commerce, has shipbuilding docks, numerous manufactures, and a large export trade in herrings, iron, steel, copper, and timber. **Malmoë,** a strongly-fortified manufacturing town on the Sound. **Lund,** a very ancient town, where the kings of Scania were elected in the middle ages, is the seat of a university. **Carlscrona,** by far the best naval station in Scandinavia, has a large export trade in metals, potash, and other Baltic produce. **Kalmar,** famous for the treaty of 1397, which united the kingdoms of Denmark, Norway, and Sweden. **Norrköping,** a thriving manufacturing town, noted for its broadcloth. **Linköping,** an ancient town, near which was fought, in 1596, the battle of Stangebro, in which Sigismund was defeated by his uncle Charles IX. **Stockholm,** the capital of Sweden since the seventeenth century, and the chief commercial emporium of Scandinavia, is built partly on the mainland, and partly on a number of islands on the strait connecting Lake Mælar with the Baltic: the houses are chiefly of brick or painted wood, the streets unpaved, narrow, crooked, and dirty, but the palace and some of the public buildings are very fine. It has numerous learned societies, the most celebrated of which is the Academy of Sciences. **Upsala,** the former capital of Sweden, with a far-famed university, in which Linnæus, Celsius, Bergmann, Scheele,

* The pronunciation of Norwegian names differs considerably from that of the Danish, though in all other respects the two languages are nearly identical. The following are the chief peculiarities of the Norwegian :—

e final has a distinct sound, as in Molde (*Mol'deh*).
o at the end of a syllable = *oo* in food, as Odense (*Oo'den-seh*).
aa = *o* in not, as Roraas (*Roo'ros*).
öe make two syllables, as in Tromsöe (*Trom'sö-e*).
uu = *oo* in food, as Agershuus (*Ag'ers-hoos*).
d = English *d*, and not like *th*, as in Danish.
g is always hard, as in Stavanger (*Sta-vang'ger*).

and Berzelius, were professors. **Dannemora**, the site of the largest and most valuable iron-mines in the world. **Fahlun**, with a great copper-mine, which has been wrought for upwards of 1000 years. **Gefle**, one of the principal towns in Sweden as regards shipping and commerce.

NORWAY.—**Christiania**, capital of the kingdom of Norway, finely situated at the head of a long narrow *fiord* on the south-east coast, is a small city possessed of no architectural beauty, but the streets are straight, broad, and well paved, and the environs are exceedingly picturesque. It contains a university, a royal palace, the national arsenal, and various educational and scientific establishments. **Frederickshald**, noted for its strong fortress, in besieging which, in 1718, Charles XII. of Sweden was killed. **Christiansand**, a trading seaport town, with shipbuilding docks. **Bergen**, the commercial capital of Norway, and its most important fishing-station, is well fortified, and is a station for a naval squadron: notwithstanding its high latitude, the harbour is seldom frozen. **Trondhjem**, the ancient capital of Norway, and the place where its sovereigns are still crowned, carries on an active trade in deals, dried fish, tar, and copper. **Roraas**, noted for its extensive copper-mines. **Hammerfest**, the most northern town in Europe (lat. 70° 38′), enjoys the light of the sun, in summer, for two months without interruption. **Altengaard**, noted for its raised beaches, which conclusively show that in the course of ages the surrounding country has attained a greatly higher elevation than formerly.

Capes and Islands.—Cape Nordkyn, the most northern point of the continent of Europe (lat. 71° 5′); North Cape, on the island Magerōe; Statland, S.W. of province Trondhjem; the Naze, the most southern point of Norway. ISLANDS: Magerōe and Soröe groups, N.W. of Finmarken; Tromsōe and Lofoden groups, N.W. of Nordland; Vigten, Fröyen, Hitteren, and Smölen, off the coast of Trondhjem; Œland and Gothland, S.E. of Sweden.

Gulfs and Straits.—Varanger Fiord and Porsanger Fiord, N. of Finmarken; West Fiord, bet. Nordland and the Lofoden Isles; Trondhjem Fiord and Romsdal Fiord, W. of Trondhjem; Sogne Fiord and Hardanger Fiord, W. of Bergen; Bukke Fiord, W. of Christiansand; Skager Rack, bet. Norway and Denmark; the Kattegat and Sound, bet. Sweden and Denmark; Kalmar Sound, bet. Sweden and Œland; Gulf of Bothnia, bet. Sweden and Finland.

Surface and Mountains.—An immense mountain-range, known as the Scandinavian or Norwegian Alps, traverses the western side of the peninsula, from the Naze to the North Cape, the southern half of it being confined to Norway, and the northern forming, for the most part, the boundary between Norway and Sweden. Its total length is about 1150 miles, with a breadth varying from 200 miles in the south to 60 in the north. The range consists of a series of plateaux or elevated table-lands, separated here and there by deep narrow valleys, and is very rich in minerals. It is usually divided into three sections—viz.:

Hardanger Field, in the south of Norway, separating the waters that enter the Skager Rack from those that flow westward to the Atlantic:

highest summit, Skageslöestinden, the culminating-point of Scandinavia, 8670 feet (lat. 61° 10′). Height of snow-line in this chain, 5000 feet.

Dovre Field, between Agershuus and Trondhjem, separating the basins of the Glommen and Gotha from the Atlantic: highest summit, Sneehätten, 7620 feet (lat. 62° 20′).

Kiolen Mountains, between Norway and Sweden, forming the water-parting between the Baltic and the Atlantic: highest summit, Sulitelma, 6200 feet (lat. 67° 3′). Height of snow-line on Sulitelma, 3500 feet. The total extent of country elevated above the snow-line is said to exceed 3500 sq. miles.

Glaciers, &c.—The glaciers of Scandinavia are numerous, though less known than those of Switzerland. They are found in three principal groups—viz., a southern, central, and northern group. The farthest south contains the Folgefond glacier, S.E. of Bergen (lat. 60°), which is the first glacier met with travelling northward; and the Nygaard and Lodal glaciers, near Skageslöestinden, which in summer discharge 5,000,000 cubic fathoms of snow per day into the river Justedal. The second group is in the Kiolen Mountains: it includes Sulitelma, and is usually called the Fondal group. The last group, called Jokulsfield, is in the neighbourhood of Altengaard, and is remarkable as descending to the level of the sea, into which it projects some of its members a considerable distance. The WATERFALLS of Scandinavia have long been celebrated. The most remarkable is the Trolhätta Fall, on the Gotha. The river descends 112 feet, in several successive leaps, presenting a spectacle extremely grand, the quantity of water being greater than in any other waterfall in Europe. The other principal waterfalls in Norway are the Sarpen, on the Glommen, near Frederickstadt, 60 feet high; the Riukan Fos, formed by the Maan, which issues from the mountain-lake of Miös-Wasser, in the Upper Tellemark, and descends perpendicularly 800 feet; and the Vöring-Fos, in Bergen, which descends from a height of 900 feet.

River-Basins.—These are all small, owing to the peculiar configuration of the country, and its being traversed by mountains and elevated table-lands through its entire length. There are no reliable data for estimating the area of any of them, except the Glommen (16,000 sq. m.) and the Gotha (17,000 sq. m.)

Lakes.—The lakes of Scandinavia are extremely numerous. In Norway alone there are said to be 30,000; but they are generally of very limited extent. Nearly one-eighth of the surface of Sweden is covered with lakes, some of them being of considerable magnitude, as Wener, 2020 sq. m.; Wetter, 710 sq. m.; and Mælar, 472 sq. m. The largest lake in Norway is Miösen, 63 m. long by 12 m. broad. Almost all the lakes of Scandinavia are on the eastern side of the great mountain-chain. In the basin of the *Glommen* is L. Miösen; *Gotha*, Wener, Foemund; *Matala*, Wetter; *Mælar*, Mælar, Hielmar; *Dal*, Siljan; *Umea*, Stor-Uman; *Skeleftea*, Stor-Avan; *Lulea*, Stor-Lulea; *Tornea*, Tornea.

Table of Rivers and Towns.—All the important rivers of the peninsula take their rise on the eastern slope of the mountains, and pursue a S.E. course to the Skager Rack and Kattegat (branches of the North Sea), or to the Baltic; while the W. slope is traversed by numerous mountain torrents and by deeply-penetrating fiords.

Basins inclined to the Atlantic and North Sea.

Rivers.	*Towns.*
Alten,	HAMMERFEST, *Altengard.*
Wessen	ALSTAHOUG.
Trondhjem Fiord,	TRONDHJEM or DRONTHEIM.
Sundal,	*Christiansund.*
Kors Fiord,	BERGEN.
Bukke Fiord,	Stavanger.
Mandals,	*Mandal.*
Torrisdals,	CHRISTIANSAND.
Nid,	Arendal.
Skeens Elf,	*Skeen.*
Lauven,	*Laurvig, Kongsberg.*
G. of Christiania	Frederickshald, *Frederickstadt*, CHRISTIANIA.
Drammen,	Drammen.
Glommen, *l*	*Frederickstadt, Roraas.*
W. co. Gothland,	*Uddevalla, Halmstad.*
Gotha,	GOTHENBURG, Wenersborg, Mariestad, Carlstad.
Clara,	Carlstad.
The Sound,	*Helsingborg*, Landskrona, Lund, Malmöe.

Basins inclined to the Baltic.

S. co. Gothland,	Ystad, *Carlshamn*, Carlscrona.
Helge,	*Christianstad.*
Kalmar Sound,	*Christianopel*, Kalmar, *Westervik.*
Motala,	Linköping, Norrköping, Jönköping.
L. Mælar and R. Arboga,	STOCKHOLM, *Westerås.*
Sala, *l*	Upsala, *Dannemora.*
Hielmar,	OREBRO.
Dal,	GEFLE, n.
Fahlun, *l*	Fahlun.
Indals,	*Sundsvall, Ostersund.*
Angermann,	HERNÖSAND.
Umea,	*Umea.*
Pitea,	*Pitea.*
Lulea,	*Lulea.*

Climate.—Owing to its being nearly surrounded by the sea, Scandinavia enjoys comparatively a very mild climate. On the western side of the great mountain-chain it is milder than on the eastern side, and greatly more humid. The snow-line is much higher than in corresponding latitudes of other countries, and the cereals extend much farther N. In Siberia the cultivation of grain ceases at lat. 60°, while in Norway it extends to lat. 70°. Even at the North Cape the sea never freezes; but the shallow and comparatively fresh water of the Baltic and Skager Rack are generally covered with ice, in winter, near the coasts. In the interior of Sweden the summers are very hot, and the winters extremely cold. Here mercury often freezes north of lat. 61°, and snow covers the ground for nearly six months in the year. Spring is almost unknown, and from eight to twelve weeks usually suffice for sowing, ripening, and reaping the crops. Owing to the length of the day and the great heat, barley may be sown and reaped at Hammerfest within the space of six weeks. The fall of rain on the west coast, where the mountains intercept the westerly winds, usually amounts to from 70 to 80 inches, but on the eastern side it is much less (see p. 32).

Geology.—The most remarkable circumstance in the geology of Scandinavia is the fact that the whole peninsula, N. of lat. 56° 3′, is ascertained to be gradually rising at the rate of four feet in a century; while in a small district south of this there is a corresponding subsidence. Crystalline schists occupy five-sixths of the entire surface, and constitute the great mountain-chain. Granite is of comparatively rare occurrence, except on both sides of the West Fiord, the western side of Christiania Fiord, the district lying bet. Lake Wetter and the Baltic, and a tract in the basin of the river Dal. Silurian strata cover two

extensive areas—one in the N. of Finmarken, and the other in the centre of the peninsula, extending from the parallel of Bergen to near the arctic circle. Upper palæozoic and trap rocks occur in the upper basin of the Dal.

Minerals.—The iron-mines of Sweden are the most famous in the world, and yield on an average 70,000 tons annually. The Swedish iron imported into Great Britain is mainly used for the manufacture of steel. In 1867, we received 60,056 tons of bar-iron and 4656 tons of unwrought-steel from Sweden. The best iron is found in the län Upsala. Copper is also abundant, the mines of Fahlun alone formerly yielding 500 tons annually, but the supply is rapidly declining. Silver is found to a small extent, and cobalt is worked in several places. Other products are—coal, of an inferior quality, lime, granite, and porphyry. The mountains of Norway are rich in minerals, but from the difficulty of transport and the scarcity of fuel, mining industry is but little developed. There are 23 mining establishments, but they are confined to iron, copper, silver, cobalt, and chrome. Gold, lead, alum, and graphite also occur, but in small quantities, as also magnetic iron and garnets of a beautiful green colour. The silver-mine of Kongsberg, worked since 1624, was formerly regarded as the richest in Europe.

Botany and Agriculture.—The flora of Scandinavia is wholly embraced in Schouw's *first* and *second* phyto-geographic regions, or the "region of saxifrages and mosses," and the "region of the umbelliferæ and cruciferæ." The former, also called the *Alpine Arctic flora*, includes Finmarken and the higher elevations of the mountain-range; and the latter, the entire remainder of the peninsula. According to Fries, the flowering-plants of Scandinavia are distributed as follows.: total number of species in Lapland, 697; in Norway, 1200; Sweden, south of the lakes, 1416; Sweden, north of the lakes, 1256. Among trees, the pine tribe is the most important, forming, in the south, extensive forests. Spruce and Scotch pines are largely exported to England, where, owing to their resinous qualities, they are highly prized. The fir extends to the Polar Circle, the pine beyond it, while the birch is found as far north as lat. 70°, and at an elevation of 1580 feet. A fourth part of the entire surface of Sweden is covered with forests; yet the yield of timber is small, a great part of it being required for fuel, and for charcoal required in working the mines. The principal forest-trees are pine, fir, birch, oak, ash, beech, lime, elm, alder, and willow. Fruit-trees, except the cherry, are limited to the south of lat. 60°.

Among cereals, barley is the principal crop in all parts of the peninsula. In Norway it extends to lat. 70°, and in Sweden to 69°. Other kinds of grain do not thrive in Norway, except in favoured spots; but oats, rye, and even wheat are cultivated in Sweden. The soil is not generally very fertile, and not more than one-fifth of the surface of the entire peninsula is under cultivation. In Norway, only a hundredth part of the surface is under culture, and the quantity of corn raised is insufficient for home consumption, but potatoes are extensively cultivated. Owing to recent improvements in husbandry, the quantity of corn raised in Sweden fully

meets the wants of the population. The horses and cattle are small, and the sheep yield an inferior kind of wool. The reindeer is the only domestic animal north of lat. 64°, where Iceland moss, which is its customary food, is very abundant. The dog is also employed in this region as a beast of draught.

Zoology.—The principal *Mammals* are the brown bear, wolf, lynx, fox, glutton, lemming, deer, elk, marten, hare, sable, beaver, and squirrel. *Birds*, including the eagle and falcon, are numerous, especially on the western coasts, were sea-fowl abound. The wild-goose, and eider-duck are numerous, as also the grouse and capercailzie. Wild-ducks abound in the lakes and rivers, and the swan appears in the S. in winter. The seas, lakes, and rivers, swarm with the greatest abundance of *Fish*, and fishing forms in Norway the most important branch of industry, especially the cod, herring, salmon, whale, lobster, and oyster fisheries. The rich abundance of trout and salmon renders Norway the best angling country in the world. The herring has wellnigh forsaken the eastern coast; but another species of fish resembling it (the strömling) is caught in great numbers. The waters of Scandinavia embrace three of Forbes's *Regions of Marine Life*—viz., the Arctic region on the N., the Boreal on the W., and the Celtic on the S. and S.E., including the Skager Rack, Kattegat, and Baltic.

Ethnography.—The people are all of the Scandinavian branch of the Teutonic stock, with the exception of the Finns and Lapps, who belong to the Mongolian race.

Language.—The Swedes, Norwegians, and Danes originally spoke the same language—viz., the Icelandic, old Danish, or Norse; and though the Swedish and Norwegian are now dialectically different, they are still very closely allied, both in their roots and inflections; while the Norwegian is almost identical with modern Danish. The latter is the vernacular language of the peasantry in Norway, and the Danish Bible is the only one used in the churches.

Religion.—Scandinavia is the most Protestant country in Europe. A few Finns and Lapps still remain heathens, but almost the whole Teutonic population are Protestants. Lutheranism is the State religion, both in Norway and Sweden, and the Established Church is almost universally adhered to; but other sects are tolerated by law, except Jews, Jesuits, and Mormons, in Norway. Recently, however, much intolerance has been manifested in Sweden towards native Protestants who refuse to attend the Established Church.

Education.—In both countries nearly all the young are in regular attendance at school, and scarcely a peasant can be found in the peninsula who cannot read and write. This is mainly owing to a law which prohibits marriage to all who have not been admitted to the communion, and which admits to the communion only those who can read. There are three universities—viz., those of Christiania, Upsala, and Lund, besides colleges and high schools in all the principal towns.

National Character.—The Norwegians are generally tall and vigorous, and distinguished by the lightness of their hair. They evince a strong predilection for a seafaring life, and make excellent sailors. They are extremely tenacious of old customs, and are peculiarly jealous of all encroachments on the part of Sweden. In both countries, intemperance is the prevailing vice. The Swedes are characterised by a tall, robust

stature, light hair, blue eyes, and fair complexion; they are intelligent, active, and enterprising, and extremely fond of scientific pursuits.

Literature.—The literature of Scandinavia is adorned by many names of more than European reputation, especially in the department of physical science.

POETRY: Sternhjelm, Dalin, Creutz, Gyllenborg, Runeberg, Bishop Tegnor, Böttiger, Atterbom, Franzen, Nicander, Kellgren. HISTORY: Geijer, Fryxell, Dalin, Lagerbring, Strinnholm, Ekelund, Ahlquist. PHYSICAL SCIENCE: In botany, Linnæus, Fries, Wahlenberg, Hasselquist; in chemistry, Scheele, Bergmann, Berzelius; in mineralogy, Rinmann; in medicine, Rosenstein; in mechanics, Polhem, Alströmer; in mathematics, Celsius, Klingenstierna; in architecture, Tessin; in geography, Forsell; and in ethnography, Professor Nilsen. MORAL SCIENCE: Grubbe, Biberg. THEOLOGY: Wingard, Wallin, Emanuel Swedenborg. FINE ARTS; In sculpture, Bystrom, Göthe; in painting, Fahlcrantz, Hörberg. MISCELLANEOUS: Cederborg, Livijn, Frederica Bremer, Baroness Knorring, Engström, Hopken, Hermanson, and Almquist.

Government, &c.—Norway is a limited hereditary monarchy, united with Sweden since 1814, each country retaining its own laws and legislative assemblies. The reigning sovereign, Charles XV., resides in Sweden the greater part of the year, but is bound to visit Norway annually. In the absence of the king, Norway is governed by a viceroy, who resides at Christiania. The Legislative Assembly of Norway is called the Storthing, a body which possesses greater powers than even the British Parliament,—a bill after being passed in three successive assemblies becoming law, even without the royal assent. The Swedish National Assembly is called the Diet, which consists of four Chambers, and shares the legislative power with the sovereign.

Army and Navy.—The armies of the two countries are separate, but in time of war both are commanded by the king. In 1865, the Swedish army numbered 144,000 soldiers, and the Norwegian, 12,150. In 1867, the Swedish navy comprised 48 war-vessels, carrying 462 guns, besides 125 gunboats; while the navy of Norway amounted to 156 vessels, carrying 5000 guns and 4000 men. The united *Revenue*, in 1868, amounted to £3,098,000; the *Expenditure* to £3,378,000; and the *Public Debt* to £5,451,000.

Commerce and Manufactures.—At the end of 1868, the mercantile marine of both kingdoms comprised 8562 ships, carrying 998,232 tons. The foreign trade is principally with Great Britain, Russia, Denmark, Portugal, and Germany. The commerce of Sweden with Great Britain is twice as great as with any other country. The principal articles exported from the peninsula are deals and timber, bar-iron and steel, oats, fish, ice, tar, pitch, turpentine, and some copper; while the chief articles imported are woollen manufactures, averaging £120,000 per annum, wrought and unwrought iron, salt, grain, and articles of colonial produce. Next in importance to the timber trade are the fisheries, which consist mainly of cod and herring.

The *Manufactures* of Sweden consist chiefly of articles of home consumption, as woollen, cotton, and linen cloth, sugar, tobacco, and paper. Tanning is an important branch of industry: distilling and brewing are

extensively prosecuted, and shipbuilding is carried on to some extent. There are few manufactures in Norway: brandy distilleries and saw-mills are numerous; next to these are forges and metal-foundries, the produce of which is generally exported in a raw state. Iron-wire and nails are important items of industry, as also coarse woollen, linen, and cotton cloth for domestic use, glass, paper, oil, gunpowder, soap, tobacco, sugar-refining, and shipbuilding.

Internal Communication.—This is very deficient, especially in Norway, where few of the rivers are navigable for any considerable distance. The Glommen, the largest river in the kingdom, is navigable for only 14 miles; but regular steam communication has been established between the towns along the coast. The principal canals are the Gotha Canal, which connects the Kattegat with the Baltic, by the Gotha river and Lakes Wener and Wetter, avoiding the celebrated Trolhätta Fall; the Hielmar or Arboga Canal, uniting Lakes Mælar and Hielmar; and the Södertelge Canal, joining the southern extremity of Lake Mælar with the Baltic. In 1869, there were 1175 miles of railway open in the peninsula, of which 1103 miles belonged to Sweden. Railways connect Stockholm with Gothenburg, Jönköping, and Fahlun; while others are in progress in Gothland, which will connect it with Copenhagen and Stralsund, by Malmöe and Ystad. In Norway, a short line has been constructed between the capital and Lake Miösen, and another uniting the valleys of the Glommen and Logen.

Foreign Possessions.—The only foreign possession belonging to Sweden is the small island of St Bartholomew in the West Indies. It was ceded by France to Sweden in 1784, has an area of 16 sq. m., and a population of 2898.

Historical Sketch.—Sweden, Norway, and the greater part of Denmark were anciently known as Scandinavia, from which proceeded the Normans or Northmen, who conquered Normandy in the beginning of the 9th century, and England in 1066. Until the 7th century, Norway was governed by petty rulers. About 630, Olaf, of the race of Odin, was expelled from Sweden, and established a colony in Vermeland, which became the nucleus of a monarchy founded by his descendant, Halfdan III., in 824. The ancient inhabitants of Sweden were the Fins, a diminutive race, who retired to Finland, their present territory, on the appearance of the Goths, who have ever since been masters of Sweden. The Christian faith was established in Norway about A.D. 998, and in Sweden in the beginning of the eleventh century. Stockholm was founded in 1260, and Christiania in 1624. By the Union of Kalmar (1397), Norway, Sweden, and Denmark were united under Margaret. Denmark and Norway separated from Sweden in 1523, when Gustavus Vasa ascended the throne of Sweden. His illustrious descendant, Gustavus Adolphus, fell at the battle of Lutzen, in 1632. In 1524 Sweden embraced the Reformed religion. Finland, formerly part of Sweden, was ceded to Russia by the treaty of Frederickshamm, 1809; and Norway was united to Sweden by the treaty of Kiel, 1814.

ELEMENTS OF MODERN GEOGRAPHY.

BY THE

REV. ALEX. MACKAY, LL.D. F.R.G.S.

Author of 'A Manual of Modern Geography, Mathematical, Physical, and Political, &c. &c.

Seventh Edition, crown 8vo, pp. 304, price 3s.

OPINIONS.

Sir RODERICK IMPEY MURCHISON, K.C.B., President of the Royal Geographical Society, in his Anniversary Address, says:—"Among the elementary publications, I may direct attention to a useful little work, by the Rev. Alexander Mackay, entitled 'Elements of Modern Geography' (Blackwood & Sons). In a former Address I ventured to commend the 'Manual of Geography' by the same author; and the present production is an improved and careful epitome of that work, which can be recommended as a text-book to be used in the educational establishments of the country. Considering that the author is—as I know myself—actively employed as a minister of religion in the heart of Aberdeenshire, remote from access to libraries and the great marts of knowledge, I cannot but admire the assiduity and research displayed in the preparation of this elementary treatise."

A. KEITH JOHNSTON, LL.D. F.R.S.E. F.R.G.S., H.M. Geographer for Scotland, Author of the 'Physical Atlas,' &c. &c.—"There is no work of the kind, in the English or any other language, known to me, which comes so near my *ideal* of perfection in a school-book, on the important subject of which it treats. In arrangement, style, selection of matter, clearness, and thorough accuracy of statement, it is without a rival; and knowing, as I do, the vast amount of labour and research you bestowed on its production, I trust it will be so appreciated as to insure, by an extensive sale, a well-merited reward."

RICHARD G. GRAHAM, English Master, College for Daughters of Ministers of the Church of Scotland and of Professors in the Scottish Universities.—"No work with which I am acquainted so amply fulfils the conditions of a perfect text-book in the important subject of which it treats, as Dr Mackay's 'Elements of Modern Geography.' In fulness and accuracy of details, in the scientific grouping of facts, combined with clearness and simplicity of statement, it stands alone, and leaves almost nothing to be desired in the way of improvement. Eminently fitted, by reason of this exceptional variety and thoroughness, to meet all the requirements of higher education, it is never without a living interest, which adapts it to the intelligence of ordinary pupils. It is not the least of its merits that its information is abreast of all the latest developments in geographical science, accurately exhibiting both the recent political and territorial changes in Europe, and the many important results of modern travel and research.

"By the publication of such a work the Author has conferred a boon upon the whole teaching profession, and I have no doubt that his labours will be duly appreciated."

Daily News.—"These 'Elements,' simple as they appear in their present form, could only have been written by one who had made the facts of geography the subject of long and profound study. . . . The order and arrangement of the volume is superior to that of any other one likely to come into comparison with it, and immensely increases its utility."

Spectator.—"The best Geography we have ever met with."

Athenæum.—"Full of sound information, including the results of the most recent investigations, and in every respect corresponding to the actual state of geographical knowledge, both physical and political."

WILLIAM BLACKWOOD AND SONS.

OUTLINES OF MODERN GEOGRAPHY;

A BOOK FOR BEGINNERS.

BY THE

REV. ALEX. MACKAY, LL.D. F.R.G.S.

Author of 'A Manual of Modern Geography, Mathematical, Physical, and Political,' &c. &c.

Ninth Edition, 18mo, pp. 112, price 1s.

These Outlines—in many respects an epitome of the Author's 'Elements'—are carefully prepared to meet the wants of beginners. The arrangement is the same as in the Author's larger works; minute details are avoided, the broad outlines are graphically presented, the accentuation marked, and the most recent changes in political geography exhibited.

"The Rev. A. Mackay, whose 'Manual of Modern Geography,' and 'Elements of Modern Geography,' have met with deserved approbation, has now completed the course by publishing 'Outlines of Modern Geography: a Book for Beginners' (Blackwood and Sons), which possesses all the requisites of an excellent introduction. By means of a skilful arrangement of the materials, and a judicious adaption of the type, a vast amount of essential geographical knowledge is conveyed within moderate limits, and in a very convenient form. Due prominence is given to the natural features of the different countries; advantage has been taken of the latest discoveries and census returns; and the accentuation of proper names is marked in needful cases."—*Athenæum.*

"We must commend the judicious selection of the facts which are classified under the different headings. They are precisely such as it is most important to communicate early, in order to give the youthful student a good general idea of the character, people, and products of the countries of the world, and to interest him in prosecuting the study further."—*Daily Review.*

"The Author has produced three of the best works on geography extant. The 'Manual' is universally acknowledged as by far the best work of its kind yet published. . . . The 'Elements' are unsurpassed by any text-book on the subject. They are peculiarly fitted for the higher classes in our common schools, while the 'Outlines' are specially suited for classes less advanced, and for those schools in which the pupils do not remain long enough to admit of a thorough exhaustion of the larger text-books. . . . We commend them most cordially to the notice of all teachers, assuring them that they will find them superior as text-books to any of those generally in use."—*Wick Journal.*

"This is a most admirable epitome of Mr Mackay's two former works, the 'Manual' and the 'Elements,' executed with that painstaking care and economy which characterises everything that comes from Mr Mackay's pen."—*Aberdeen Free Press.*

"Formed on the River-Basin system, like the larger volumes, it contains within the compass of 112 pages a vast amount of accurate information, carefully and judiciously arranged. . . . The author has evinced peculiar aptitude for the undertaking."—*Inverness Courier.*

WILLIAM BLACKWOOD AND SONS.

Second Edition, Crown 8vo, pp. 336, price 4s.

FACTS AND DATES;

OR,

THE LEADING EVENTS IN SACRED AND PROFANE HISTORY, AND THE PRINCIPAL FACTS IN THE VARIOUS PHYSICAL SCIENCES:

THE MEMORY BEING AIDED THROUGHOUT BY A SIMPLE AND NATURAL METHOD.

For Schools and Private Reference.

BY THE

REV. ALEX. MACKAY, LL.D. F.R.G.S.

Author of 'A Manual of Modern Geography, Mathematical, Physical, and Political,' &c. &c.

OPINIONS OF THE PRESS.

"A most valuable book of reference, which will be of immense service to students of history. His wide knowledge has directed the author at once to the most trustworthy guides in the various departments of the almost illimitable field he has traversed. . . . Every date throughout is embodied in a mnemonic sentence, so happily and tersely illustrative of the event, as to leave us fairly astonished at the patience and ingenuity of the author."—*Papers for the Schoolmaster.*

"This work is a wonderfully elaborate production. . . . 'Facts and Dates,' which in some hands would furnish forth a cyclopædia of tolerable dimensions, have their essence extracted, and here appear in the moderate compass of 317 pages. . . . Great care has been taken to bring the volume in all respects to the point which the material and historical sciences have at present reached, while deep reverence for the Bible breathes through the volume."—*London Weekly Review.*

"'Facts and Dates' is the name of a very neat and well-compiled collection of tables, not exclusively chronological, though all involving numbers. But the chief feature is an extremely simple system of mnemonics, by means of which a few appropriate words attached to each fact or event are made to carry with them a string of figures."—*Guardian.*

"Dr Mackay's book is planned with great ingenuity and skill. It is a text-book of physical science and universal chronology, adapted for scholastic purposes, on a principle of *natural mnemonics*, and gives evidence of much labour and research."—*Nonconformist.*

"A valuable text-book of physical science and universal chronology. . . . The plan is exceedingly ingenious, and at the same time eminently simple and natural."—*London Scotsman.*

"There are certainly the elements of a very desirable auxiliary to students and general readers in this portion of Dr Mackay's volume, and we hope he will expand and elaborate the part alluded to in a future publication."—*Athenæum.*

"There is a most interesting chapter on Scripture chronology, written in an admirable spirit, and displaying much ingenuity and research. . . . Our deliberate opinion is, that it is one of the finest books of the kind we have ever met with."—*Daily Review.*

"We can aver that this compendium of Facts and Dates contains a vast amount of accurate and well-digested information; and we may add that in the hands of a competent schoolmaster it must prove a most effective instrument of teaching on the subjects to which it relates."—*Edinburgh Courant.*

"The second division deals with historical facts; in other words, it gives the chronology of the leading facts of history, and is subdivided into two parts—the one summarising sacred history in three chapters, and the other, profane history in nine chapters. This division of the book is also of great value."—*Aberdeen Journal.*

"The research of historic data, and mastery of scientific facts and principles, with the careful manner in which they are tabulated, cannot fail to add yet further to the Author's reputation."—*Aberdeen Free Press.*

"We have not the least doubt that the system can be introduced with much advantage into some of the younger classes in every school, while more advanced students will gladly welcome it as an aid to memory that will be of daily and hourly use."—*Banffshire Journal.*

"A very valuable book for teachers, and still more so for students preparing for public examinations of any kind."—*Ayr Advertiser.*

"The care and labour requisite for the production of such a work are out of all proportion to its size, and we must congratulate the author on the extreme accuracy and comprehensiveness of the scientific part of the work, which is scrupulously written up to the knowledge of the times, and includes the latest discoveries in each of the sciences."—*John o' Groat Journal.*

"The amount of industry, intelligence, and research it represents is something enormous, and the way in which a valuable *comment* on a fact is *made to give up the date* is most ingenious."—*Brighton Herald.*

"It is a work suited to almost all ages—not too far advanced or profound for the schoolroom, and, on the other hand, many engaged in literary pursuits, or preparing for public examination, will find it most useful as a work of reference."—*Dublin Mail.*

"It will be more than valuable to the student and teacher of history as a sort of *vade mecum*. In the division of ancient history it is particularly full, and especially in all that relates to Egypt—the author having obtained for that department of his labours the aid of the most advanced scholars in 'Egyptology.' In this portion of the book there will be found a condensed and deeply interesting account of the discoveries and measurements of the Great Pyramid—that wonder of wonders come down to us from hoary time."—*Montrose Review.*

"The volume is not a bare catalogue of statistics, for every department of the book is prefaced by a very able and interesting introduction, bringing out in a condensed form the prominent and latest discoveries and views in connection with the respective subjects, and also the most reliable sources of information. The labour and research of the author must have been enormous, the fruit of which will be reaped by the reader with the smallest amount of trouble. The volume will be specially valuable as a text-book for advanced classes and students, and as a book of reference in the library."—*Press and St James's Chronicle.*

"Considerable ingenuity has been displayed in making the mnemonic sentences illustrate the character of the various facts; and, mnemonics apart, the book, in an educational sense, is of unquestionable value."—*Weekly Dispatch.*

"No pains have been spared to select the facts most worthy of being remembered, and to determine the dates according to the most approved system of modern chronology. Each chapter is preceded by a longer or shorter discussion of the subject on hand, remarkable for its elaborate learning and great conciseness."—*Glasgow Journal.*

WILLIAM BLACKWOOD AND SONS.

EDUCATIONAL BOOKS

PUBLISHED BY

WILLIAM BLACKWOOD AND SONS,

EDINBURGH AND LONDON.

NEW WORKS ON GEOGRAPHY.

BY THE

REV. ALEXANDER MACKAY,

LL.D. F.R.G.S.

I.

A MANUAL OF MODERN GEOGRAPHY, Mathematical, Physical, and Political. With a copious Index. Crown 8vo, pp. 760, price 7s. 6d.

This volume—the result of many years' unremitting application—is specially adapted for the use of Teachers, Advanced Classes, Candidates for the Civil Service, and proficients in geography generally.

II.

TWELFTH THOUSAND.

ELEMENTS OF MODERN GEOGRAPHY, for the Use of Junior Classes. Crown 8vo, pp. 300, price 3s.

The 'Elements' form a careful condensation of the 'Manual,' the order of arrangement being the same, the river-systems of the globe playing the same conspicuous part, the pronunciation being given, and the results of the latest census being uniformly exhibited. This volume is now extensively introduced into many of the best schools in the kingdom.

III.

TWENTY-EIGHTH THOUSAND.

OUTLINES OF MODERN GEOGRAPHY: A Book for Beginners. 18mo, pp. 112, price 1s.

These 'Outlines'—in many respects an epitome of the 'Elements'—are carefully prepared to meet the wants of beginners. The arrangement is the same as in the Author's larger works. Minute details are avoided, the broad outlines are graphically presented, the accentuation marked, and the most recent changes in political geography exhibited.

IV.

NINETEENTH THOUSAND.

FIRST STEPS IN GEOGRAPHY. 18mo, pp. 56, price 4d. Sewed, or 6d. in Cloth.

V.

GEOGRAPHY OF THE BRITISH EMPIRE. Price 3d.

DR MACKAY'S ELEMENTARY GEOGRAPHIES.

OPINIONS.

Sir RODERICK IMPEY MURCHISON, K.C.B., President of the Royal Geographical Society, in his Anniversary Address, 1864, says of the 'Elements':—"Among the elementary publications, I may direct attention to a useful little work, by the Rev. Alexander Mackay, entitled 'Elements of Modern Geography' (Blackwood and Sons). In a former Address I ventured to commend the 'Manual of Geography' by the same author; and the present production is an improved and careful epitome of that work, which can be recommended as a text-book to be used in the educational establishments of the country. . . . I cannot but admire the assiduity and research displayed in the preparation of this elementary treatise."

A. KEITH JOHNSTON, LL.D. F.R.S.E. F.R.G.S., H.M. Geographer for Scotland, Author of the 'Physical Atlas,' &c. &c.—"There is no work of the kind, in the English or any other language, known to me, which comes so near my *ideal* of perfection in a school-book, on the important subject of which it treats. In arrangement, style, selection of matter, clearness, and thorough accuracy of statement, it is without a rival; and knowing, as I do, the vast amount of labour and research you bestowed on its production, I trust it will be so appreciated as to insure, by an extensive sale, a well-merited reward."

English Journal of Education.—"Of all the Manuals on Geography that have come under our notice, we place the one whose title is given above (the 'Manual') in the first rank. For fulness of information, for knowledge of method in arrangement, for the manner in which the details are handled, we know of no work that can, in these respects, compete with Mr Mackay's Manual."

The London Weekly Review.—"The book (the 'Manual') is a most valuable repertory of the facts of the science, remarkably full and accurate in detail. We cordially and earnestly recommend it for the higher classes in schools, for colleges, and to a permanent place, for the purpose of reference, in the library."

Spectator.—"The best Geography we have ever met with."

Athenæum.—"Full of sound information, including the results of the most recent investigations, such as those of Captain Speke in Africa, and in every respect corresponding to the actual state of geographical knowledge, both physical and political."

Museum.—"We are glad to be able very strongly to commend the 'Elements' to the attention of teachers, as one of the best, one of the very good school-books of geography in existence. We can recommend it on account of its fulness, yet within manageable limits. Its information is the most recent. We have tested its accuracy, by comparison with independent sources of information within our reach, and that in connection with our own country, with Denmark, and the United States: we have in no case found any serious discrepancy. To accuracy and freshness of matter it adds terseness of style and clearness of arrangement,—the latter much aided by varieties of typography."

IMPROVED EDITIONS.

SCHOOL ATLASES

By A. KEITH JOHNSTON, LL.D., &c.
Author of the "Royal Atlas," the "Physical Atlas," &c.

I.

ATLAS OF GENERAL AND DESCRIPTIVE GEOGRAPHY.

A New and Enlarged Edition, suited to the best Text-Books; with Geographical information brought up to the time of publication. 26 Maps, clearly and uniformly printed in colours, with Index. Imp. 8vo. Half-bd., 12s. 6d.

II.

ATLAS OF PHYSICAL GEOGRAPHY,

Illustrating, in a Series of Original Designs, the Elementary Facts of GEOLOGY, HYDROGRAPHY, METEOROLOGY, and NATURAL HISTORY. A New and Enlarged Edition, containing 4 new Maps and Letterpress. 20 Coloured Maps. Imp. 8vo. Half-bound, 12s. 6d.

III.

ATLAS OF ASTRONOMY.

A New and Enlarged Edition, 21 coloured Plates. With an Elementary Survey of the Heavens, designed as an accompaniment to this Atlas, by ROBERT GRANT, LL.D., &c., Professor of Astronomy and Director of the Observatory in the University of Glasgow. Imp. 8vo. Half-bd., 12s. 6d.

IV.

ATLAS OF CLASSICAL GEOGRAPHY.

A New and Enlarged Edition. Constructed from the best materials, and embodying the results of the most recent investigations, accompanied by a complete INDEX OF PLACES, in which the proper quantities are given by T. HARVEY and E. WORSLEY, MM.A., Oxon. 23 Coloured Maps. Imp. 8vo. Half-bd., 12s. 6d.

"This edition is so much enlarged and improved as to be virtually a new work, surpassing everything else of the kind extant, both in utility and beauty."—*Athenæum.*

V.

ELEMENTARY ATLAS OF GENERAL AND DESCRIPTIVE GEOGRAPHY,

For the use of Junior Classes; including a MAP OF CANAAN and PALESTINE, with GENERAL INDEX. 8vo, half-bd., 5s.

"The plan of these Atlases is admirable, and the excellence of the plan is rivalled by the beauty of the execution. . . . The best security of the accuracy and substantial value of a School Atlas is to have it from the hands of a man like our Author, who has perfected his skill by the execution of much larger works, and gained a character which he will be careful not to jeopardise by attaching his name to anything that is crude, slovenly, or superficial."—*Scotsman.*

NEW ATLAS by A. KEITH JOHNSTON.

THE HANDY ROYAL ATLAS.

By ALEX. KEITH JOHNSTON, LL.D. &c.

Author of the 'Royal Atlas,' the 'Physical Atlas,' &c.

45 Maps Clearly Printed and Carefully Coloured, with General Index.

Imperial Quarto, price £2, 12s. 6d., half-bound morocco.

This work has been constructed for the purpose of placing in the hands of the public a useful and thoroughly accurate Atlas of Maps of Modern Geography, in a convenient form, and at a moderate price. It is based on the 'Royal Atlas,' by the same author; and, in so far as the scale permits, it comprises many of the excellences which its prototype is acknowledged to possess. The aim has been to make the book strictly what its name implies, a Handy Atlas—a valuable substitute for the 'Royal,' where that is too bulky or too expensive to find a place, a needful auxiliary to the junior branches of families, and a *vade mecum* to the tutor and the pupil-teacher.

"Is probably the best work of the kind now published."—*Times.*

"Not only are the present territorial adjustments duly registered in all these maps, but the latest discoveries in Central Asia, in Africa, and America, have been delineated with laborious fidelity. Indeed, the ample illustration of recent discovery, and of the great groups of dependencies on the British Crown, renders Dr Johnston's the best of all Atlases for English use."—*Pall Mall Gazette.*

"This is Mr Keith Johnston's admirable Royal Atlas diminished in bulk and scale, so as to be, perhaps, fairly entitled to the name of 'handy,' but still not so much diminished but what it constitutes an accurate and useful general Atlas for ordinary households."—*Spectator.*

"He has given us in a portable form geography posted to the last discovery and the last Revolution."—*Saturday Review.*

Fourth Edition, 1s. 6d.

ENGLISH PROSE COMPOSITION,

A PRACTICAL MANUAL FOR USE IN SCHOOLS.

BY

JAMES CURRIE, M.A.,

PRINCIPAL OF THE CHURCH OF SCOTLAND TRAINING COLLEGE, EDINBURGH.

"We do not remember having seen a work so completely to our mind as this, which combines sound theory with judicious practice. Proceeding step by step, it advances from the formation of the shortest sentences to the composition of complete essays, the pupil being everywhere furnished with all needful assistance in the way of models and hints. Nobody can work through such a book as this without thoroughly understanding the structure of sentences, and acquiring facility in arranging and expressing his thoughts appropriately. It ought to be extensively used."—*Athenæum, September* 21, 1867.

WORKS
ON
GEOLOGY AND PHYSICAL GEOGRAPHY.
By DAVID PAGE, LL.D. F.R.S.E. F.G.S.

GEOLOGY FOR GENERAL READERS. A Series of Popular Sketches in Geology and Palæontology. Second Edition, containing several new Chapters. Price 6s.

"This is one of the best of Mr Page's many good books. It is written in a flowing popular style. Without illustration or any extraneous aid, the narrative must prove attractive to any intelligent reader."—*Geological Magazine.*

HANDBOOK OF GEOLOGICAL TERMS, GEOLOGY, AND PHYSICAL GEOGRAPHY. Second Edition, enlarged. 7s. 6d.

INTRODUCTORY TEXT-BOOK OF GEOLOGY. With Engravings on Wood and Glossarial Index. Seventh Edition. 2s.

"Of late it has not been our good fortune to examine a text-book on science of which we could express an opinion so entirely favourable as we are enabled to do of Mr Page's little work."—*Athenæum.*

ADVANCED TEXT-BOOK OF GEOLOGY, Descriptive and Industrial. With Engravings, and Glossary of Scientific Terms. Fourth Edition, revised and enlarged. 7s. 6d.

"We have carefully read this truly satisfactory book, and do not hesitate to say that it is an excellent compendium of the great facts of Geology, and written in a truthful and philosophic spirit."—*Edinburgh Philosophical Journal.*

"We know of no Introduction containing a larger amount of information in the same space, and which we could more cordially recommend to the geological student."—*Athenæum.*

THE GEOLOGICAL EXAMINATOR. A Progressive Series of Questions, adapted to the Introductory and Advanced Text-Books of Geology. Prepared to assist Teachers in framing their Examinations, and Students in testing their own Progress and Proficiency. Third Edition. 9d.

INTRODUCTORY TEXT-BOOK OF PHYSICAL GEO-GRAPHY. With Sketch-Maps and Illustrations. Third Edition. 2s.

"A work which cannot fail to be useful to all who are entering on the study of Physical Geography. We believe, indeed, that many will be induced to enter on the study from a perusal of this little work. The divisions of the subject are so clearly defined, the explanations are so lucid, the relations of one portion of the subject to another are so satisfactorily shown, and, above all, the bearings of the allied sciences to Physical Geography are brought out with so much precision, that every reader will feel that difficulties have been removed, and the path of study smoothed before him."—*Athenæum.*

ADVANCED TEXT-BOOK OF PHYSICAL GEOGRA-PHY. With Engravings. 5s.

"A thoroughly good Text-Book of Physical Geography."—*Saturday Review.*

EXAMINATIONS ON PHYSICAL GEOGRAPHY. A Pro-gressive Series of Questions, adapted to the Introductory and Advanced Text-Books of Physical Geography. 9d.

THE PAST AND PRESENT LIFE OF THE GLOBE. With numerous Illustrations. Crown 8vo, 6s.

CHIPS AND CHAPTERS. A Book for Amateurs and Young Geologists. 5s.

FORTIFICATION: FOR OFFICERS OF THE ARMY AND STUDENTS OF MILITARY HISTORY. By Lieut. HENRY YULE, Bengal Engineers. With Illustrations. 8vo, 16s. 6d.

"An excellent manual; one of the best works of its class."—*British Army Despatch.*

In post 8vo, price 5s.

ELEMENTARY ARITHMETIC. By Edward Sang, F.R.S.E.

This treatise is intended to supply the great desideratum of an intellectual instead of a routine course of instruction in Arithmetic.

In crown 8vo, price 5s.

THE HIGHER ARITHMETIC. By the same Author. Being a Sequel to 'Elementary Arithmetic.'

"We know, indeed, of no more complete philosophy of pure arithmetic than they contain; they are well worthy of Sir John Leslie's favourite pupil. It is almost needless to add, that we consider the reasoning of these volumes both thorough and close, and the expression of that reasoning uniformly simple and clear."—*Edinburgh Weekly Review.*

Price Sixpence, for the Waistcoat Pocket

FIVE PLACE LOGARITHMS. Arranged by E. Sang, F.R.S.E.

TREATISE ON ARITHMETIC, with numerous Exercises for Teaching in Classes. By JAMES WATSON, one of the Masters of Heriot's Hospital. Foolscap, 1s.

AINSLIE'S LAND-SURVEYING. A New and Enlarged Edition, em-bracing RAILWAY, MILITARY, MARINE, and GEODETICAL SURVEYING. By W. GALBRAITH, M.A. In 8vo, with plates in 4to, price 21s.

"The best book on Land-Surveying with which I am acquainted."—WM. RUTHERFORD, LL.D. F.R.A.S., *Royal Military Academy, Woolwich.*

SIR WILLIAM HAMILTON'S LECTURES ON METAPHYSICS. Edited by the Rev. H. L. MANSEL, B.D. LL.D., Waynflete Professor of Moral and Metaphysical Philosophy, Oxford; and JOHN VEITCH, M.A., Professor of Logic and Rhetoric in the University of Glasgow. Fourth Edition. In 2 vols. 8vo, price 24s.

SIR WILLIAM HAMILTON'S LECTURES ON LOGIC. Edited by Professors MANSEL and VEITCH. Second Edition. In 2 vols. 8vo, price 24s.

INSTITUTES OF METAPHYSIC. The Theory of Knowing and BEING. By JAMES F. FERRIER, B.A. Oxon., late Professor of Moral Philosophy and Political Economy, St Andrews. Second Edition. Crown 8vo, price 10s. 6d.

DESCARTES ON THE METHOD OF RIGHTLY CONDUCTING THE REASON, and Seeking Truth in the Sciences; and his MEDITATIONS, and SELECTIONS from his PRINCIPLES OF PHILOSOPHY. In one vol., price 4s. 6d.

CHOIX DES MEILLEURES SCENES DE MOLIÈRE, avec des Notes de Divers Commentateurs, et autres Notes Explicatives. Par Dr E. DUBUC. Fcap. 8vo, price 4s. 6d.

Sixteenth Edition.

EPITOME OF ALISON'S HISTORY OF EUROPE, for the Use of Schools and Young Persons. Post 8vo, pp. 604, price 7s. 6d. bound in leather.

In compiling this Epitome, it has been specially held in view to omit or suppress no *fact* of the slightest importance, and to limit the abridgment to the condensation of the minor and accessory details; and it is trusted that an adherence to this rule, while it has produced a work in which the interest of the narrative never flags, has also secured a history of the time in all essential particulars as complete as the more voluminous records of it.

A Chronological Table has been added of all the principal events, so arranged as to give a clear idea of the order in which they succeed each other; and a full Table of Contents, containing a synopsis of the subjects treated of in the body of the work.

ATLAS to Epitome of the History of Europe. Eleven Coloured Maps, by A. Keith Johnston, LL.D. F.R.S.E. In 4to, price 7s.

School Edition, post 8vo, with Index, price 6s.

HISTORY OF FRANCE, from the Earliest Times to 1848. By the Rev. James White, Author of 'The Eighteen Christian Centuries.'

"This book makes an attempt to furnish a readable account of the country with which we are in closest neighbourhood, and yet of whose history the generality of us know less than of that of almost any other kingdom. It aims at something higher than a mere epitome, for it founds itself on a great deal of various reading, and gives results more than abstracts. At the same time it devotes sufficient space to any occurrences which seem to have a general bearing on the progress or character of the nation. But it does not profess to be very minute in its record of trifling or uninfluential occurrences, nor philosophic in searching out the causes of obscure events."—*Author's Preface.*

"Contains every leading incident worth the telling, and abounds in word-painting, whereof a paragraph has often as much active life in it as one of those inch-square etchings of the great Callot."—*Athenæum.*

School Edition, post 8vo, with Index, price 6s.

THE EIGHTEEN CHRISTIAN CENTURIES. By the Rev. James White, Author of 'The History of France.'

"He has seized the salient points—indeed, the governing incidents—in each century, and shown their received bearing as well on their own age as on the progress of the world. Vigorously and briefly, often by a single touch, has he marked the traits of leading men; when needful, he touches slightly their biographical career. The state of the country and of society, of arts and learning, and, more than all, of the modes of living, are graphically sketched, and upon the whole with more fulness than any other division."—*Spectator.*

"By far the best historical epitome we have ever perused, and it supplies a great want in this knowing age."—*Atlas.*

ELEMENTARY TEXT-BOOK OF SCRIPTURE HISTORY. By Thomas Struthers. Part I. From the Creation to the Death of Moses. Price 6d.

A GLOSSARY OF NAVIGATION. Containing the Definitions and Propositions of the Science, Explanation of Terms, and Description of Instruments. By the Rev. J. B. Harbord, M.A., St John's College, Cambridge; Chaplain and Naval Instructor, R.N. In Crown Octavo, Illustrated with Diagrams, price 6s.

DEFINITIONS AND DIAGRAMS IN ASTRONOMY AND NAVIGA- TION. By the Same. Price 1s. 6d.

COMPARATIVE GEOGRAPHY. By Carl Ritter. Translated by W. L. Gage. Fcap., price 3s. 6d.

Just published, a New Edition, price 8s. 6d. cloth, with Engravings and Charts.

A HANDY BOOK
OF
METEOROLOGY.

BY

ALEXANDER BUCHAN, M.A.,

Secretary of the Scottish Meteorological Society.

EXTRACTS FROM REVIEWS OF FIRST EDITION.

"A very handy book this, for in its small compass Mr Buchan has stored more and later information than exists in any volume with which we are acquainted."—*Symons's Monthly Meteorological Magazine.*

"To those who wish to have a really 'handy' book on meteorology, clear, concise, and easy of reference, we should certainly recommend Mr Buchan's work."—*The Field.*

"We know of no modern English treatise on meteorology that can compare, in comprehensiveness and conciseness, originality and accuracy, with Mr Buchan's unpretending little manual."—*Nonconformist.*

"After a minute examination of Mr Buchan's book, we feel entitled to say that it is really the best and *handiest* book on the subject that we know; and we have studied a good many of them."—*Aberdeen Journal.*

"Admirably fitted for the object which it is designed to serve—that of assisting people who have not made scientific matters their especial study to form intelligent notions on the subject of which it treats."—*Weekly News.*

"A volume such as this, which explains not only all meteorological phenomena, so far as they are at present understood, but the method of using the various instruments required for the purpose of taking observations, and of repairing them when out of order, cannot fail to be widely appreciated."—*Weekly Despatch.*

"It is also well suited to be used as a text-book in educational establishments, where, we hope, the study of meteorology will be introduced in common with that of the kindred sciences."—*Farmer.*

"We do not know a better book on meteorology; and certainly it is by far the best book on that subject which we know for the horticulturist, the farmer, and, speaking generally, the unscientific reader. Every gardener of the least pretensions to an intelligent knowledge of his profession should not only possess it, but thoroughly master it."—*Gardeners' Chronicle.*

"We have placed it in the row of authorities on our table, ready for reference; for it is, most truly, what it is designated, 'A Handy Book.' It is one of those books, too few in number, which contain nothing but what is desirable to be in its pages, and all is told clearly and pleasantly, as no one can narrate except a writer who is thoroughly master of his subject. We have not often the pleasure of speaking thus of a publication, and every reader of the volume will assent to our opinion of its merits."—*Journal of Horticulture.*

NEW WORKS ON GEOGRAPHY.

A MANUAL OF MODERN GEOGRAPHY.

ELEMENTS OF MODERN GEOGRAPHY.

OUTLINES OF MODERN GEOGRAPHY. A Book

FIRST STEPS IN GEOGRAPHY.

GEOGRAPHY OF THE BRITISH

IMPROVED EDITIONS.

SCHOOL ATLASES,

By A. KEITH JOHNSTON, LL.D., &c.

Author of the Royal and the Physical Atlases, &c.

ATLAS OF GENERAL AND DESCRIPTIVE GEOGRAPHY. A New and Enlarged Edition, edited to the last Year's Census, with Geographical Information brought up to the time of publication. 28 Maps, county and numerous general Illustrations, and Index. Imp 8vo. Half-bound, 12s 6d.

ATLAS OF PHYSICAL GEOGRAPHY, Illustrating, in a series of Original Designs, the Elementary Facts of Geology, Hydrography, Meteorology, and Natural History. A New and Enlarged edition, containing 24 Maps and Diagrams. With Illustrations. Imp 8vo. Half-bound, 12s 6d.

ATLAS OF ASTRONOMY. A New and Enlarged Edition. 21 Celestial Plates. With an Elementary Survey of the Heavens, designed as an accompaniment to the Atlas. By ROBERT GRANT, LL.D., &c., Professor of Astronomy and Director of the Observatory in the University of Glasgow. Imp 8vo. Half-bound, 10s 6d.

ATLAS OF CLASSICAL GEOGRAPHY. A New and Enlarged Edition. Constructed from the best materials and embodying the results of the most recent investigations, accompanied by a complete Index of Places, in which the proper quantities are given by T. HARVEY and Sir WILLIAM M'ARTHUR, M.P.A. Oxon. 21 Coloured Maps. Imp 8vo. Half-bound, 12s 6d.

"The Scholar will at once recognise this Atlas as a valuable addition to our scholastic apparatus."—*Athenæum*.

ELEMENTARY ATLAS OF GENERAL AND DESCRIPTIVE GEOGRAPHY, for the Use of Junior Classes; including a Map of Canada and Palestine, with Original Index. 8vo, half-bound, 3s.

WILLIAM BLACKWOOD & SONS, EDINBURGH AND LONDON.